POPULAR SCIENCE

MONTHLY

MECHANICS - AUTOS - HOMEBUILDING

Robot Uses Hand Tools

PAGE 100

25¢

December

U.S. Now Flies World's Fastest Fighter

PAGE 94

Studebaker's New Wagon

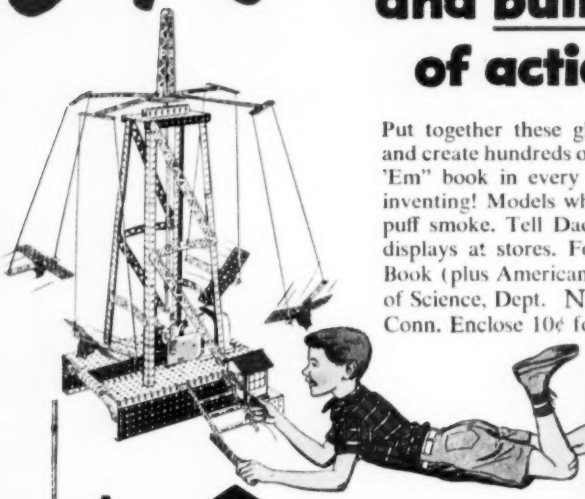
PAGE 110

Home Uses for Aluminum

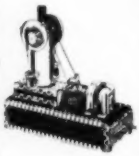
PAGE 159

BOYS! Get ERECTOR®

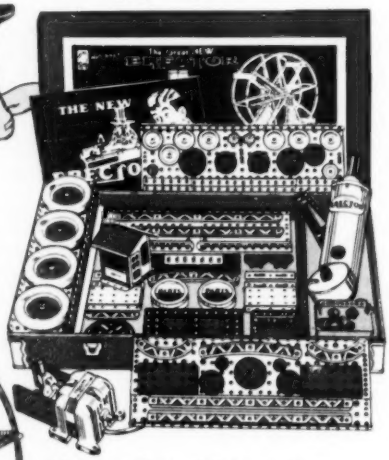
and build hundreds of action models



Put together these gleaming STEEL precision parts and create hundreds of toys! Illustrated "How to Make 'Em" book in every set. But you can do your own inventing! Models whistle, "choo-choo," light up and puff smoke. Tell Dad you want ERECTOR and see displays at stores. For ERECTOR and Gilbert Toy Book (plus American Flyer trains) write Gilbert Hall of Science, Dept. N, Erector Square, New Haven 6, Conn. Enclose 10¢ for handling, postage.



Make this high-swinging airplane ride with ERECTOR No. 6½.
No. 6½ has over 350 parts – sturdy girders, gears, wheels, etc. "Powerhouse" electric engine features many speeds (including reverse) to put *action* into your models. Builds pile driver, elevator, lift bridge, hundreds of other wonderful toys *that work.* **$12.95***



Square Girder Construction
Precision-matched parts easily lock together with nuts and bolts. Can't wobble or warp. Build bridges that hold more than *200 pounds.* Parts have lasting gleam.

Huge ferris wheel turns fast or slow; reverses. Made with ERECTOR No. 8½.
The all-electric set (No. 8½) has nearly *16* lbs. of parts! Includes 4-speed forward and reverse electric engine, electric lights, electromagnet! Build a mighty crane, oil drilling rig, portable derrick, etc. Heavy gauge steel chest. **$23.50***

*ERECTOR prices slightly higher Denver and West

WORLD'S MOST FASCINATING CHRISTMAS GIFT

JR. ENGINEERS AT WORK WITH ERECTOR!

ERECTOR PRICES START AT $2.00*

"OWN a Business" Coupon

DURACLEAN CO., 3-18D Duraclean Bldg., Deerfield, Illinois

Without obligation to me, send booklet and letter giving full details. Tell me how I may OWN a growing business of my own built upon satisfield customers.

Name _____

Address _____

City _____ State _____

We'll train & establish you.

Are You The Man?

If you are dependable, honest and willing to work to own a large-profit, lifetime business and become financially independent, we invite you to mail the above coupon for full details. We are now enlarging this 23-year-old, world-wide chain of **individually-owned** service businesses. We'll establish you in YOUR OWN business and help finance you. You use successful methods of established Duraclean dealers. This is a nationally advertised, lifetime business. You can average $5.00 hourly gross profit on service you render and $3.00 on **EACH** of your servicemen at National Price Guide charges. **Easy to learn . . . quickly established.**

Revive, Clean and Protect Rugs and Upholstery!

The remarkable Duraclean Service (illustrated below) restores the natural fibre lubrication of wool and other animal fibres. Resiliency returns to the pile. It rises again. Brilliant colors revive. Results in many instances are almost unbelievable.

Duraclean Service banishes the need of cleaning upholstery, rugs and carpeting by harsh machine scrubbing and soaking. It eliminates harmful solvents and strong soaps.

The aerated foam, created by the **patented** electric Foamovator, cleans by ABSORPTION—not by scrubbing. Dirt, grease and many unsightly spots vanish like magic. Furnishings become clean, fresh, enlivened.

Forestall Damage by Moths & Carpet Beetles

The Duraproof Service (illustrated above) not only kills moths and carpet-beetles but is also WARRANTED to make fabrics **repellent** to both. The U. S. Government says, **"Moths are present in practically every household. . . . No section of the country seems free from such infestations."** Damage to household goods and wearing apparel is greater from moths than from fire. This modern treatment DEFINITELY PROTECTS rugs, carpets, upholstery, furs, clothing, blankets, piano-felts, auto interiors, etc.

What Dealers Say

W. Lockiehill: "We've had 20 years of pleasant dealings. I'm 65 but am setting my sights for 20 more years."

G. F. Munroe: "Took in $8,198.26 first 12 months."

P. Freidinger: "We had a big mothproof business last year; one job alone was $322.25."

R. Kimbrough: "Finished First White House of Confederacy and am to Duraclean the Governor's Mansion."

O. Corbett (Canada): "Several hundred dollars in jobs lined up from canvassing."

H. Satterfield: Duracleaned chair for largest department store and got order for 60-75 chairs, couches & davenports."

E. Schenk: "The customers I had on **House and Garden** ads were very pleased. Their furnishings came out beautiful."

A. Ullman: "It is very encouraging that every demonstration has been a sale."

Margarette Turner: "Took in $106 and worked 15 or 18 hours."

L. Johnson: "Each customer leads to 3 or 4 more."

No Shop Needed—EASY to Learn

No overhead expense. Service may be rendered in homes, offices, hotels, theaters, institutions, etc., by your service men. Auto dealers have upholstery revived in used cars. Some Duracleaners establish shops or an office — others operate from their homes.

Start Part or Full Time

No experience needed. We show you 27 ways to get customers. Almost **every building** houses a potential customer. A waiting market is in small and large towns alike. These year-round services are in constant need.

Nationally Advertised

Your services are advertised in magazines such as Life, McCall's, House & Garden, Ladies Home Journal, House Beautiful, New Yorker, Better Homes & Gardens, etc. These ads give your services national prestige.

Easy Terms!

A moderate payment establishes **your own** business—pay balance from profits. We furnish electric machines, folders, store-cards, introduction slips, sales book, demonstrators and enough materials to return your TOTAL investment. You can have your business operating **in a very few days.** Mail above coupon. No obligation.

Repeat & Voluntary Orders

Demonstrations win customers. Duracleaners find REPEAT and VOLUNTARY orders a main income. Customers, enthused at results, tell friends and neighbors. Your service is recommended nationally by America's foremost furniture and department stores.

Double Profits

You enjoy large profits on both materials and labor. To start, you may want to render service yourself. You have cooperation of a world-wide organization interested in YOUR success.

FREE Booklet

Our letter and FREE 16 page illustrated booklet will explain everything—these modern urgently needed services, the waiting market, how business grows, your large profits, easy terms and protected territory. Mail coupon TODAY. No obligation.

An established DURACLEAN dealer will work with you

World-wide Services

DURACLEAN CO., 3-18D Duraclean Bldg., Deerfield, Illinois

Mail Coupon TODAY—While Territory Is Open

America's Leading New-Idea Magazine for 81 Years

Founded 1872, Vol. 163: No. 6

POPULAR SCIENCE
REG. U. S. PAT. OFF. *Monthly*

Mechanics and Handicraft
REG. U. S. PAT. OFF.

VOLTA TORREY, EDITOR • Howard Allaway, MANAGING EDITOR
Howard C. Jensen, ART EDITOR • Frank Rowsome Jr., ASSISTANT MANAGING EDITOR

SENIOR EDITORS: Harry Walton (Mechanics & Handicraft), Hartley E. Howe (Features), Martin Mann (Copy).

ASSOCIATE EDITORS: Alden P. Armagnac, Thomas Berger, Henry B. Comstock, Devon Francis, Sheldon M. Gallager, Kendall W. Goodwyn, Wesley S. Griswold, Herbert O. Johansen, Herbert R. Pfister, Robert P. Stevenson, Ruth Westphal.

ART: Harry Samuels (Director), Herbert Anthony, Eric Karminski Jr., Frances Cooper Daniels, Mary Dee.

PHOTOGRAPHY: W. W. Morris (Director), Hubert Luckett, Orlando Guerra.

EDITORIAL ASSISTANTS: Harriet Trowbridge, Carol Ennis, Louise Levis, Trudie Ray, Teresa Robbins, Grace A. Schwartz, Georgette Sparks.

MIDWESTERN EDITOR: Kenneth Wylie (Chicago) • WESTERN EDITOR: Andrew R. Boone (Los Angeles)

For Junior:
Space Helmet Radio..209
Helicopter Lamp.....218

For Sister:
Prefab Dollhouse.....212
Doll Furniture.....218
Jewelry Box.....224

For Mother:
Plant Holder.....222
Serving Plate.....222
Cookbook Holder.....224
Candle Hot Plate.....224
Snack Table.....224

For Father:
Footstool 226
Weather Vane.....226

For the Family:
Electric Panel.....216
Tree Stand.....217
Table Tree.....218

For Cousins:
Map Tables.....220

DECEMBER, 1953

Diesels Even Run Bikes Now..... 81
Infrared Rays Clarify Bible Texts..... 86
The Fastest Fighter in the World..... 94
Plug-In Workman Built in 90 Days.....100
Event One Thousand!.....107
Studebaker Brings Out 1954 Conestoga.....110
Canada Delivers the Christmas Mail.....116
Games Disclose Secrets of Success.....125
Life in a Bubble Can Be Beautiful.....133
Fastest Freight Train.....140
Rocket Water Yields Wonder Products.....145
Wilbur Shaw Reports on the '54 Nash.....152
You Can Use Aluminum Like Wood.....159
Gus Rides with Santa Claus.....178
Safety Belts Help You Drive.....183
How Lift Sawing Stretches Wood.....189
Box-Camera Wizard Snaps Famous People..192
How to Build the Fastest Clipper Ship.....202

(More features and departments are listed on page 4.)

Godfrey Hammond, PUBLISHER • Stephen P. Glennon, ADVERTISING DIRECTOR

ADVERTISING OFFICES: NEW YORK—353 Fourth Ave.; CHICAGO—360 North Michigan Ave.; DETROIT—820 Book Bldg.; SAN FRANCISCO—681 Market St.; CLEVELAND—328 Citizens Bldg.; LOS ANGELES—2550 Beverly Blvd.
EDITORIAL OFFICES: 353 Fourth Avenue, New York 10, N. Y.

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, President and Treasurer; R. C. Wilson, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second class matter July 26, 1948 at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1953, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, $3.00 (2 years $5.50; 3 years $7.50); foreign countries $1 per year extra. Four weeks' notice is needed to change a subscriber's address. Please give both old and new addresses, including postal zone numbers.

They claim this coupon brings you "good luck"

"Six months after mailing the coupon, I had a promotion and a big raise in pay!"

"From the moment I marked the coupon, my luck changed!"

"My break came when I sent the coupon!"

These statements are typical! I.C.S. gets letters like these regularly. Coupon senders report pay raises. Others win important promotions or new, interesting assignments. Still others find happiness, job security, opportunities never dreamed possible.

Is it LUCK? The results are so impressive, so quick in coming, that some say the I.C.S. coupon is "lucky." Of course, that's not true. The real reason for these amazing results is what happens to the person when he or she mails the coupon.

Coupon is first step! Naturally, you want to make good. But you've put off doing something about it. Mailing this coupon is *definite action!* It shows you're fed up with waiting for the breaks. You're determined to make your own breaks! And this determination alone accounts for much of the "luck" you'll start to experience.

You get free guidance! Within a few days you get the helpful and inspiring 36-page book, "How to Succeed." It's crammed with information. For example, it tells you in detail how to plan your career. Also how to prepare for advancement. In addition, you get a free catalog on the I.C.S. course that interests you. With your new-found determination and these two books as your guides, you're ready to cash in on your hidden abilities!

391 I.C.S. courses! You'll find a partial list of courses in the coupon below. Each course is up-to-date, extremely practical, completely success-tested. You study in your spare time. Set your own pace. Correspond directly with instructors. Cost is low. Diplomas are awarded to graduates. I.C.S. training rates high in all fields of business and industry. You won't find another school like it.

Call it being "lucky" or being "smart." Whatever it is, you're one step closer to your goal when you mail this famous coupon!

I.C.S.—the lifetime Christmas gift

I. C. S., Scranton 9, Penna.

INTERNATIONAL CORRESPONDENCE SCHOOLS ICS

BOX 7665-N, SCRANTON 9, PENNA.

Without cost or obligation, send me "HOW to SUCCEED" and the booklet about the course BEFORE which I have marked X:

ART
- ☐ Commercial Art
- ☐ Magazine Illustrating
- ☐ Fashion Illustrating
- ☐ Cartooning
- ☐ Sketching and Painting
- ☐ Show Card and Sign Lettering

AUTOMOTIVE
- ☐ Automobile, Mechanic
- ☐ Auto Elec. Technician
- ☐ Auto Body Rebuilding and Refinishing
- ☐ Diesel—Gas Engines

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft Engine Mechanic
- ☐ Airplane Drafting

BUILDING
- ☐ Architecture
- ☐ Arch. Drafting
- ☐ Building Contractor
- ☐ Estimating
- ☐ Carpenter and Mill Work
- ☐ Carpenter Foreman
- ☐ Reading Blueprints
- ☐ House Planning
- ☐ Plumbing
- ☐ Heating
- ☐ Painting Contractor
- ☐ Air Conditioning
- ☐ Electrician

BUSINESS
- ☐ Business Administration
- ☐ Certified Public Accountant
- ☐ Bookkeeping and Accounting
- ☐ Office Management
- ☐ Stenography and Typing
- ☐ Secretarial
- ☐ Federal Tax
- ☐ Business Correspondence
- ☐ Letter-writing Improvement
- ☐ Personnel and Labor Relations
- ☐ Advertising
- ☐ Retail Business Management
- ☐ Managing Small Business
- ☐ Ocean Navigation
- ☐ Sales Management
- ☐ Short Story Writing
- ☐ Creative Salesmanship
- ☐ Traffic Management

CHEMISTRY
- ☐ Chemical Engineering
- ☐ Chemistry
- ☐ Analytical Chemistry
- ☐ Petroleum—Nat'l Gas
- ☐ Pulp and Paper Making
- ☐ Plastics

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping
- ☐ Structural Drafting
- ☐ Highway Engineering
- ☐ Reading Blueprints
- ☐ Construction Engineering
- ☐ Sanitary Engineering

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Structural Drafting
- ☐ Sheet Metal Drafting
- ☐ Ship Drafting
- ☐ Mine Surveying and Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrician
- ☐ Electrical Maintenance
- ☐ Electrical Drafting
- ☐ Electric Power and Light
- ☐ Lineman

HIGH SCHOOL
- ☐ High School Subjects
- ☐ Mathematics
- ☐ Commercial
- ☐ Good English

MECHANICAL AND SHOP
- ☐ Mechanical Engineering
- ☐ Industrial Engineering
- ☐ Industrial Supervision
- ☐ Foremanship
- ☐ Mechanical Drafting
- ☐ Machine Design-Drafting
- ☐ Machine Shop Practice
- ☐ Tool Design
- ☐ Industrial Instrumentation
- ☐ Machine Shop Inspection
- ☐ Reading Blueprints
- ☐ Toolmaking
- ☐ Gas—Electric Welding
- ☐ Heat Treatment—Metallurgy
- ☐ Sheet Metal Work
- ☐ Sheet Metal Pattern Drafting
- ☐ Refrigeration

POWER
- ☐ Combustion Engineering
- ☐ Diesel—Electric
- ☐ Electric Light and Power
- ☐ Stationary Steam Engineering
- ☐ Stationary Fireman

RADIO, TELEVISION COMMUNICATIONS
- ☐ Practical Radio—TV Eng'r'ing
- ☐ Radio Operating
- ☐ Radio and TV Servicing
- ☐ Television—Technician
- ☐ Electronics
- ☐ Telephone Work

RAILROAD
- ☐ Locomotive Engineer
- ☐ Diesel Locomotive
- ☐ Air Brakes ☐ Car Inspector
- ☐ Railroad Administration

TEXTILE
- ☐ Textile Engineering
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Carding and Spinning
- ☐ Warping and Weaving
- ☐ Loom Fixing ☐ Throwing
- ☐ Finishing and Dyeing
- ☐ Textile Designing

Name_____ Age_____ Home Address_____

City_____ Zone_____ State_____ Working Hours_____ A.M. to P.M._____

Occupation_____

Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

Try the sensational PROTO No. 234 Multi-Purpose Plier and you will want one for sure! Using a patented three-piece compound leverage design, pressure applied to the handles is increased *ten times* at the jaws! This plier is actually "a chest of tools in one." It securely holds square, round and even tapered objects. To make your work easier, buy one today!

Choose PROTO for Your Other Plier Needs

In the extensive PROTO line, you will find the right size and style of plier for almost every job. And remember that every one has true *professional quality*. Send 10¢ for complete 68-page catalog to

PLOMB TOOL COMPANY

2257A Santa Fe Ave.,
Los Angeles 54, Calif.

New—the No. 243 Multiple-Groove Joint Plier, which Handles Hundreds of Jobs. Five-Position, Tongue-and-Groove Joint Prevents Slippage.

5384

PROTO TOOLS
PROTO means PROfessional TOols

Eastern Factory: Jamestown, N.Y.
Canadian Factory: London, Ont.

News and Pictures

New Toys..... 92
Swiveling Sound Beam Spots Fish..... 99
How You Fly High in Comfort.....104
Jet Proposed as Robot Raider.....122
Station Wagon Runs on Three Wheels....124
Breath Operates TV Set.....129
Airstrip Made of Snow Guards North....130
Copter Plays Cops and Robbers.....132
Mechanical Woodpecker.....137
De Soto Ups Horsepower for 1954.....157

Mechanics and Homebuilding

New Blower Huffs and Puffs.....168
Unusual Doors Are Easy to Make.....173
How I Expanded My Garage.....177
News from Auto Row.....187
Two Work Supports for Your Power Saw..196
How to Make a Snow Mask.....199
Wordless Workshop.....200
Extra Uses for a Bottle Warmer.....207

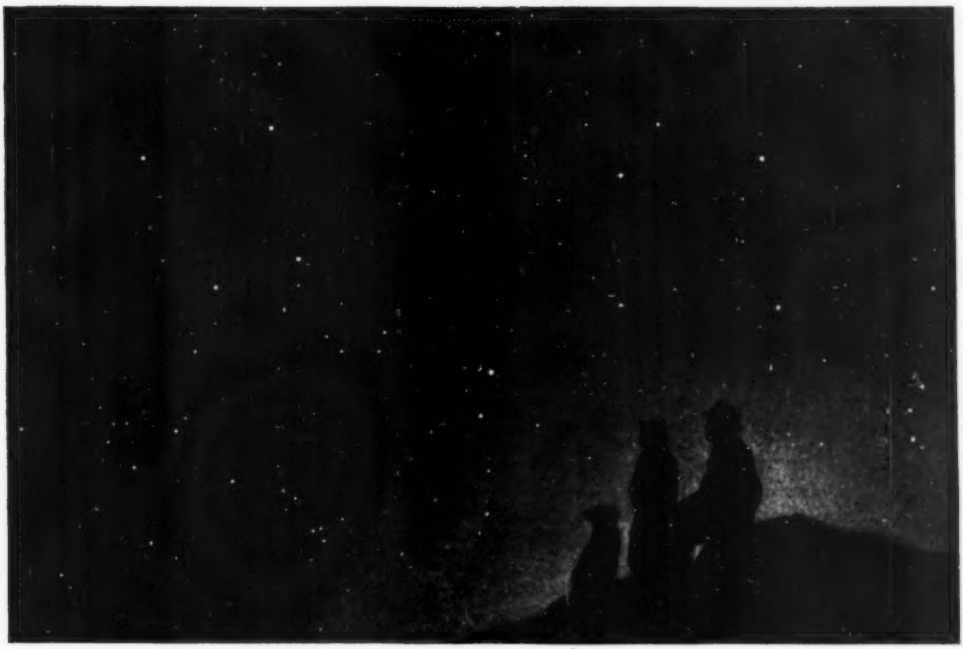
Departments

Letters 6
New Ideas from the Inventors.....113
I'd Like to See Them Make.....144
P.S. Last Minute News and Notes.....158
Keeping the Home Shipshape.....171
New for the Handy Man.....174
Hints from the Model Garage.....181
New Tools.....195
New Shop Ideas.....227

NEXT MONTH . . .

How Anyone Can Plaster

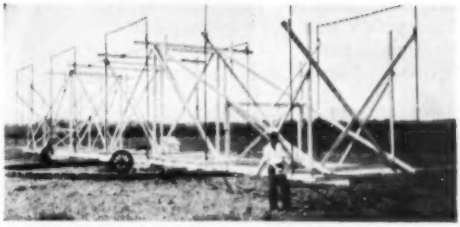
Metal lath that can be nailed over an old wall, plus easily worked lightweight plasters and new textured paints, make it possible to do a good-looking job in a weekend or two. For January, POPULAR SCIENCE MONTHLY will show you how to use these popular finishes to make old walls look new, new ones look better.



How silent is the night?

Watching the serenity of Christmas skies, we are conscious of deep silence. Yet the stars are talking to us all the while—talking in radio waves that are full of meaning to scientists probing the depths of space.

The important discovery that some stars produce radio waves was made by a Bell Laboratories scientist while exploring atmospheric disturbances which might interfere with transoceanic telephone service. His discovery marked the birth of the fast-growing science of radio astronomy. It is telling us of mysterious lightless stars that broadcast radio waves, and it promises exciting revelations about vast regions of space concealed by clouds of cosmic dust.



Directional radio antenna used by Karl G. Jansky, in the discovery of stellar radio signals at the Holmdel, New Jersey, branch of Bell Telephone Laboratories. In 1932 he detected waves of 14.6 meters coming from the direction of Sagittarius in the Milky Way.

It is another example of how Bell Telephone Laboratories scientists make broad and important discoveries as they seek ways to make your telephone serve you better.

BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

NEWS FROM SCIENCE ABOUT YOUR HAIR

V-7

—new grooming discovery outdates messy oils

Not an animal, vegetable or mineral oil, V-7 in new Vitalis Hair Tonic is a completely new greaseless grooming agent.

PROOF

you don't need grease to correct dryness

New research on human hair shows that even very dry hair regains its normal moisture content faster with new Vitalis than with any leading cream or oil hair tonic.

KEEPS YOUR HAIR NEAT ALL DAY —GREASELESSLY

Even hard-to-manage hair stays neatly in place with Vitalis. No gummy film or "oil-slick" look.

New, finer

VITALIS®

Hair Tonic with V-7

Product of Bristol-Myers

Letters

Dowsing Defended and Doubted

At the end of his article on water witching [Oct., p. 99], Howard Meyerhoff said he didn't know why the stick he had held had bent down where there was underground water. He said he wished he did know.

I can tell him. I have witched a good many wells, and I can tell to within a few feet where a well lies, even if it's 100 feet below the surface.

You can even witch over a river and your fork won't work unless there is a vein of water-bearing mineral gravel beneath it.

It's the minerals in the gravel that make the switch bend down, not the water. I can prove that if anyone should want me to.

FRANK C. DEMARS, Minneapolis.

Being a confirmed skeptic, a graduate chemist with some training in geology, I had always thought that there was nothing to

this business of dowsing until a nurseryman demonstrated the art to me near Niles, Mich. I, of course, thought he was a nut, but he handed the dowsing rod to me, and the thing began to work! I didn't want to believe it, and I tried to explain it to myself as a result of suggestion, etc. However, the rod continued to work for me and still does. I tried it with many of my friends, and I have found that perhaps one to three in 10 people can feel the pull of the rod in certain places.

Although I will agree that the rod is attracted by some force, I do not agree that it necessarily points to water. There is ground

Get into a High Pay
ACCOUNTING CAREER

LaSalle's famous staff of Accounting authorities are helping thousands prepare for fast promotions and bigger pay. They can do the same for you!

If your heart is set on a larger income and all that it means . . . better home—fine car—larger bank account—more of the good things of life. . . .

If that's your ambition and you are really serious about it, then you owe it to yourself to get the REAL FACTS about Accountancy, and the many good-pay opportunities that can be YOURS through LaSalle's famous Problem Method plan.

It matters not whether you've had a single day of experience in this field—or whether you have already started but want to climb higher. LaSalle's expert training is designed to take you *from where you are . . . to where you want to be . . .* in higher positions and a lifetime career of security and good income.

WHY YOU CAN'T FAIL TO GAIN

You see on this page a panel of experts who know Accounting from A to Z . . . all the way from simple bookkeeping, on up through advanced accounting, cost accounting, auditing, income tax, and coaching for the C.P.A. degree. These are only part of LaSalle's instruction staff. But what is most important to you . . .

. . . These C.P.A. experts know how to impart their knowledge to others . . . how to help you prepare quickly yet thoroughly for success in this very lucrative field.

The proof? What stronger proof could there be than more than 4,000 Certified Public Accountants (approximately 10% of the U.S. total) who have trained with LaSalle? Or the hundreds of thousands of men and women whom LaSalle has helped qualify rapidly for more money, a brighter future, in a high-pay-lifetime career? These thousands came to us with different backgrounds of experience and varying degrees of ambition. Many have reported raises and promotions after only a few weeks of training. Thousands of them have written to say they are now earning 50% more—even *double* their former incomes—*often in less than a year.* These letters are published in book form for your inspection. They were written by real people, with real income, problems and ambitions—people who might be your next-door neighbor.

Yes, if you are really sincere in wanting to better your position—start your income climbing—enjoy a lifetime career of high standing and high reward—this friendly staff of experts can help you.

SAMPLE LESSON SENT FREE
MAIL COUPON BELOW

You don't have to wonder what LaSalle's Accountancy plan is like. You will be sent a free sample lesson, which does not obligate you in any way. Study it—keep it—see for yourself how simple, clear, and easy it is to master. This is an actual lesson right out of the regular training—to show you exactly how LaSalle's Problem Method has trained more than 1,300,000 men and women from all walks of life.

Also . . . the 48-page book, "Accountancy, the Profession That Pays," gives all the latest facts about the new and growing opportunities in five different fields of profitable employment.

This can be an important day in your life. A coupon like the one below has started hundreds of thousands of men and women toward a bigger job, a larger income. It can do the same for you.

Mail the Coupon Today!

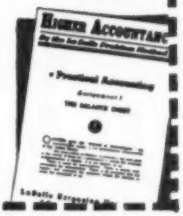
FREE 48-PAGE CATALOG

LA SALLE
EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St., Dept. 1283H, Chicago 5, Ill.

Send free Sample Lesson in Accounting—also, 48-page free book, "Accountancy, the Profession That Pays" . . . all without cost or obligation.

Name ..... *Age* .....
Address .....
City & Zone ..... *State* .....

FREE SAMPLE LESSON



water in all soil, and there is a water table at some depth almost everywhere.

Divining rods seem to be attracted to the bases of large trees, to large piles of rock, brick, concrete blocks, etc. I do not know what they point to, but I am sure that they point.

JOHN C. LEE, Terrace Park, Ohio.

A neighbor of mine once solicited the services of the local "water diviner," an old-timer who had quite a reputation, and let himself in for drilling a whole series of wells.

The first three wells all dried up within a couple of years after drilling. Finally he tried a fourth, locating it where the water diviner suggested—an inconvenient 220 yards from the house. The drillers went down 129 feet and obtained an extremely strong vein of sulfur, which is still producing very well after 22 years!

CAPT. HAROLD E. WELLS,
Eglin Air Force Base, Fla.

If any person has any doubts about its being magnetism that causes the forked stick to turn down when and where it does, I would ask him to get a good green forked stick (willow or peach is good) and a dip needle, try them out side by side, and be convinced of the truth.

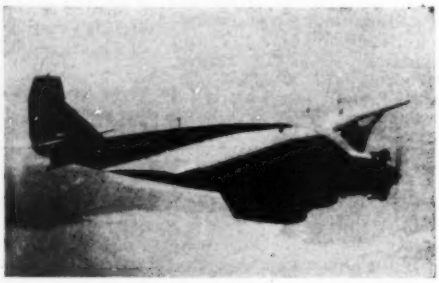
LUCIAN L. GUNN, Hardy, Neb.

"New" Wing Really Rather Old

That French airplane with the long, narrow "new" wing that you showed us in your July issue [p. 69] isn't so new, if my memory's right. The Bellanca Air-Cruiser had one like it many years ago.

JIM BARRETT, Kansas City, Kan.

So it did, and here's a picture of that pioneering Bellanca Air-Cruiser in flight in



1927, the year it was designed and built. Note that it also had a retractable landing gear, which a lot of people had talked about

Let this Imported Italian Accordion make YOU the center of your Circle

NOW! 5 DAYS **FREE** TRIAL
LOW WHOLESALE PRICE

Lifetime Guarantee

Miss Mickey Milin, America's Accordion Queen, playing her new and beautiful S. SOPRANI Moderne

All this is FREE* WITH YOUR ACCORDION

- Home study course of instruction.
- Your name in chrome letters on instrument.
- Year's supply of music.
- A de luxe music stand.
- Music Portfolio.
- Life Time Guarantee.

*For Limited time only

EASY TERMS

SAVE BUY DIRECT AT WHOLESALE

Send today for full information and our amazing offer—see, play and hear this superb instrument in your own home—let your friends and family confirm this imported professional model as the accordion of your dreams! Immediate delivery assured from the world's largest selection of leading Italian makes.

PLAY AS YOU PAY

Leading professionals acclaim our instruments as unsurpassed. "A wonderful surprise, truly an 'artist's instrument'", "In a class by itself for beauty and tone", are typical expressions. Easy to own and play with our FREE lessons. TRY BEFORE YOU BUY—No obligation. Trade-ins accepted.

Get full details of ultra-quality features and our almost unbelievable offer of big discounts to students, professionals, teachers and beginners. Boys and girls learn with ease and make quick progress—playing comes naturally. Children deserve this wholesome outlet leading to desirable associates.

YOU'LL BE PROUD TO OWN THIS S. SOPRANI ACCORDION, PRIDE OF ITALY AND OH HOW YOUR FRIENDS WILL ADMIRE AND COMPLIMENT YOU.

Read These—Culled from Hundreds

"Words cannot express our delight with the accordion. It is indeed a splendid instrument. Again let us express our heartfelt appreciation for having provided the instrument at such a reduced price. Everyone expresses delight with it. All are utterly amazed at its versatility of tone production. It certainly creates a splendid impression for your company."

Aubrey B. Martin,
Wheeling W. Va.

"Received our accordion today we are pleased with such a wonderful instrument. I have talked to my neighbor who taught accordion for 20 years and he praised this accordion highly as a wonderful instrument."

Theodore M. Swiatack
Denver, Colorado

"I am writing you from my studio and enclosing a check for down payment on my accordion which I am very pleased with indeed! I thank you for your very generous trade-in allowance on my old accordion. Thank you also for your very courteous letters.
"I like the way you do business. Trigger action and so courteous."

Bill Balduzzi,
Terre Haute, Ind.

"My accordion arrived yesterday and am thrilled and happy over the beautiful instrument and pleased with the tone it gives. It is all that you said it was and more."

Mrs. Fred Richter,
Clear Lake, Wis.

ACCORDION MANUFACTURERS & WHOLESALERS OUTLET
2003 W. Chicago Ave. Dept. 2P123 Chicago 22, Ill.

Mail Today

ACCORDION MANUFACTURERS & WHOLESALERS OUTLET
2003 W. Chicago Ave., Dept. 2P123, Chicago 22, Illinois

Please send me your fully illustrated catalog, amazing low wholesale prices, easy terms on the World's largest selection of super quality imported Italian accordions.

Name _____

Address _____

City _____ Zone _____ State _____

Motorola Car Radio

ONLY $39.95

Imagine a powerful, magnificently toned radio like this at such an unbelievably low price! High fidelity, superior tone, extra range and power. Patented motor noise filter, automatic volume control, big speaker and control head adaptable to instrument panel. So easy to install, it can be put in your car while you wait.

but no one had tried out commercially until then.

They Swap Tape Recordings

I wonder if your readers have heard of the new hobby called "tape-respondence," the exchange of tape-recorded letters. Many

people today are finding pleasure in swapping all sorts of tape recordings—such as radio programs and music—with others all over the world.

They even have a club—Tape-Respondents, International. It was formed by Fred Goetz, 3488 22nd St., San Francisco, who took up the pastime in 1948 and has since exchanged well over 1,400 wires and tapes with fellow hobbyists.

DON LEY, Dunkirk, N. Y.

Club for Parakeet Fans?

Thanks for the wonderful article and pictures on breeding parakeets [Oct., p. 140]. Some friends and I promptly bought a few birds. They are 90-percent finger-trained and amuse us with their silly tricks.

I think Wilbur Crane and Alan Hinton should start a club for parakeet fans. Seems to me there must be thousands of owners of the birds who would be glad to join for a small monthly or yearly fee and get a ready source of answers to questions that might come up about their pets.

LOUIS HABER, Bronx, N. Y.

Rear-Engine Cars in Snow

The man from Vancouver who recently wrote you that "until light-alloy engines are produced equaling today's standards, the rear-engine family car is only a dream" has provoked me to add my nickel's worth to the running argument on this subject. I can only wonder whether he has ever driven a rear-engine car.

Right now I own two, and I can say with conviction that in a country like mine (and the Vancouver man's), where there is plenty of snow, the rear-engine car really comes into its own. It will not take any great tech-

I WILL TRAIN YOU AT HOME FOR GOOD PAY JOBS IN RADIO-TELEVISION

J. E. SMITH has trained more men for Radio-Television than any other man. OUR 40th YEAR

America's Fast Growing Industry Offers You Good Pay—Bright Future—Security

I TRAINED THESE MEN

"Started to repair sets six months after enrolling. Earned $12 to $15 a week in spare time."—Adam Kramlik, Jr., Sunnytown, Pennsylvania.

"Up to our necks in Radio-Television work. Four other NRI men work here. Am happy with my work."—Glen Peterson, Bradford, Ont., Canada.

"Am doing Radio and Television Servicing full time. Now have my own shop. I owe my success to N.R.I."—Curtis Stath, Ft. Madison, Iowa.

"Am with WCOC. NRI course can't be beat. No trouble passing 1st class Radio-phone license exam."—Jesse W. Parker, Meridian, Mississippi.

"By graduation, had paid for course, car, testing equipment. Can service toughest jobs."—E. J. Streitenberger, New Boston, Ohio.

AVAILABLE TO VETERANS UNDER G I BILLS

Training plus opportunity is the PERFECT COMBINATION for job security, good pay, advancement. In good times, the trained man makes the BETTER PAY, GETS PROMOTED. When jobs are scarce, the trained man enjoys GREATER SECURITY. NRI training can help assure you more of the better things of life.

Start Soon to Make $10, $15 a Week Extra Fixing Sets

Keep your job while training. I start sending you special booklets the day you enroll, that show you how to fix sets. Multitester built with parts I send helps you make $10, $15 a week extra fixing sets while training. Many start their own Radio-Television business with spare time earnings.

My Training Is Up-To-Date

You benefit by my 40 years' experience training men at home. Well illustrated lessons give you basic principles you need. Skillfully developed kits of parts I send (see below) "bring to life" things you learn from lessons.

You Learn by Practicing with Parts I Send

Nothing takes the place of PRACTICAL EXPERIENCE. That's why NRI training is based on LEARNING BY DOING. You use parts I furnish to build many circuits common to Radio and Television. As part of my Communications Course, you build many circuits, including low power transmitter shown at left. You put it "on the air," perform procedures required of broadcast operators. With my Servicing Course you build modern Radio, etc.; use Multitester you build to make money fixing sets in spare time while training. You can stay at home, keep your job, learn Radio-TV in spare time at low cost. Mail coupon for book showing other equipment you build and keep.

The Tested Way To Better Pay!

Television Making Good Jobs, Prosperity—Even without Television, Radio is bigger than ever. 115 million home and auto Radios are big market for servicing. 3000 broadcasting stations use operators, technicians. Government, Aviation, Police, Ship, Micro-wave Relay, Two-way Radio Communications for buses, taxis, trucks, R. R. are growing fields. Television is moving ahead fast.

About 200 Television stations are now on the air. Hundreds of others being built. Good TV jobs opening up for Technicians, Operators, etc.

25 million homes now have Television sets. Thousands more are being sold every week. Get a job or have your own business selling, installing, servicing.

Radio-TV Needs Men of Action—Mail Coupon

Without obligating you in any way, I'll send an actual lesson to prove that my training is practical, thorough; 64-page book to show good job opportunities for you in Radio-TV. Terms for NRI training are as low as $5 a month. Many graduates make more in two weeks than total cost of training. Mail coupon now. J. E. SMITH, President, National Radio Institute, Dept. 3NB, Washington 9, D. C. OUR 40TH YEAR.

Good for Both—FREE

MR. J. E. SMITH, President, Dept. 3NB,
National Radio Institute, Washington 9, D. C.
Mail me Sample Lesson and 64-page Book, FREE.
(No salesman will call. Please write plainly.)

Name ..... Age .....

Address .....

City ..... Zone .... State .....

VETS write in date of discharge .....

"Cake"-*not wood* mellows your smoke

and the exclusive honey lining *cakes Yello-Bole imported briar far faster than any pipe at any price!*

The yellow in Yello-Bole is real honey—and honey cakes faster! This great Yello-Bole exclusive builds up "cake" from the first puff . . . holds the cake *fast* to fine imported briar. One pipeful—and you're smoking cool and sweet. No break-in. *No tongue sting!* It's the pipe that takes the cake!

PROOF?

Yello-Bole is the world's largest selling pipe . . . BY FAR!

YELLO-BOLE

$1.00 TO $2.50

nical knowledge to see the advantage of heavily loaded rear wheels pushing lightly loaded front wheels in snow.

G. W. White, Severn Park, Ont.

Cobb Beat Them All

The men in our company of medics have been having a little argument over racing cars. I say that there is one that has made 1,000 miles an hour. Am I right?

Pvt. Vincent D'Anton, APO 6, San Francisco.

No, not by quite a few miles an hour. The world's absolute speed record for automobiles is 394.196 m.p.h. John R. Cobb set it in a Railton Special on the Bonneville, Utah, salt flats on Sept. 16, 1947.

Rewards of Letter Writing

Your magazine must be read throughout this whole wide world. Last spring, after you had put out an especially good issue about cars, I wrote and told you how much I'd enjoyed it.

You printed my letter in April, and since then I've heard from a cousin I had lost

track of and from a fellow car enthusiast way down in Australia.

Wally Benefiel, Medicine Lodge, Kan.

Right Slant on Engines

I enjoyed your article about hot-rod railsters—"I Ain't Got No Body," July, p. 122—very much. But there is one thing I don't understand. You state that "some engines slant toward the rear for traction." I don't see why slanting the engine would give it more traction.

Donn Moore, Oak Harbor, Ohio.

There is a slight power loss at the universal joints in any car, due to the angular displacement as the propeller shaft revolves. This displacement can be reduced if the engine is cocked higher in front.

LEARN

ELECTRICITY AND ELECTRONICS

ON REAL EQUIPMENT

IN THE GREAT SHOPS OF COYNE

RADIO-TELEVISION

A GREAT BOOMING INDUSTRY

Largest, Oldest Best Equipped School of its Kind!

Thousands of successful men have been trained at Coyne over past *54 years*. There is no substitute for Coyne's wealth of experience.

The tremendous growth of this new field is almost unbelievable. TV has been given the "go-ahead" in 1227 new communities, with 1845 new stations to be built. Unusual opportunity to get in on ground floor. RADIO—TELEVISION and ELECTRONICS are vital to our Defense Program. And they offer a world of opportunities for a real future when the emergency is over. **Train quickly** on actual equipment **at Coyne** by practical-technical methods. Get big Free Book today.

ELECTRICITY—

The Power Behind Our Industrial Program

A great opportunity field and vital to Defense. Thousands of trained Electrical and Electronics men needed in good jobs and a real future. Why be satisfied with a "no future" job? Get Free Book that tells how thousands have prepared quickly for Electricity and Electronics at Coyne.

TRAIN QUICKLY AT COYNE FOR VITAL FIELDS

ELECTRICITY-RADIO-TELEVISION-ELECTRONICS-VITAL in Industry and Armed Forces. TRAIN QUICKLY for better rating, if drafted—vital job in Industry, if not. Trained men whether 17 or up to 45 needed. Prepare now for steady, well paid, essential jobs in A FIELD THAT ALSO OFFERS A REAL FUTURE WHEN THE EMERGENCY IS OVER.

START NOW—PAY LATER

Enroll now, pay most of tuition later. Monthly payment plan especially designed for K-Vets. If you need part-time work to help out with living expenses while at Coyne, we'll help you get it. Special tuition plan for men of Draft Age.

B. W. COOKE

APPROVED FOR VETERANS

1 You are TOLD the how and why of each job.

2 You're shown how to do typical jobs by trained instructors.

3 You DO practical job YOURSELF on equipment.

Mail Coupon for Big Free Book

Whether you prefer Electricity or Television-Radio, train on actual equipment, at Coyne. Fill in and mail coupon TODAY. Paste it on a postcard if you wish. A big fully illustrated booklet and complete details will come by return mail. No salesman will call.

B. W. COOKE, President

COYNE SCHOOL

A TECHNICAL TRADE INSTITUTE CHARTERED NOT FOR PROFIT
Established 1899
500 S. Paulina Dept. 93-73H
Chicago 12, Illinois

ELECTRICITY ★ TELEVISION ★ RADIO ★ REFRIGERATION ★ ELECTRONICS

B. W. COOKE, President
COYNE SCHOOL
500 S. Paulina St., Chicago 12, Ill.,
Dept. 93-73H

Send your BIG FREE BOOK and details of your training offer. This does not obligate me and no salesman will call. I am interested in:

☐ ELECTRICITY ☐ TELEVISION-RADIO

NAME.....

ADDRESS.....

CITY.....STATE.....

THE NEW MODEL 170-A

TV TUBE TESTER AND CONTINUITY INDICATOR

The majority of inoperative tubes stop functioning due to open filaments, inter-element shorts and other faults which can be located by the continuity and leakage method. The Model 170-A will test ALL the tubes used in your TV set for open filaments, inter-element shorts, burned out tubes, etc. A safeguard resistor included in the circuit network of the Model 170-A limits the output to approximately one one-thousandth of an ampere. This insures positive safety for the non-technical user and also eliminates the possibility of ever burning out a tube under test. The Model 170-A is capable of testing EVERY type of tube used in any and ALL TV sets (including picture tubes).

ADDED FEATURE:

Also included, detailed instructions for using Model 170-A as ELECTRIC CONTINUITY TESTER. Check electric toasters, fuses, heating irons, broilers, heating pads, clocks, fans, fluorescents, other bulbs, etc.

Housed in molded bakelite case. Complete with test leads and detailed easy-to-understand instructions and tube charts. Only **$4.95**

SHIPPED ON APPROVAL

NO MONEY WITH ORDER—NO C.O.D.

Kapner Hardware, Inc.
Dept. A-90. 2248 Second Ave., N. Y 29, N. Y.

Please RUSH one Model 170-A. If completely satisfied I agree to pay $4.95 within 10 days. If not, instrument will be returned (no explanation necessary).

Name .....

Address .....

City .....Zone.....State.....

FREE PREMIUM

☐ Check here if you remit $4.95 with order, and we will include 6 Key Chains wth Tube Tester — all post paid. Money-back guarantee, of course!

HEARING BAD?

If so, you will be happy to know how we have improved the hearing and relieved those miserable head noises, caused by catarrh of the head, for thousands of people **(many past 70)** who have used our simple Elmo Palliative Home Treatment in the past 16 years. This may be the answer to your prayer. **NOTHING TO WEAR.** Here are **SOME** of the symptoms that may likely be causing your catarrhal deafness and head noises: Head feels stopped up from mucus. Dropping of mucus in throat. Hawking and spitting. Mucus in nose or throat every day. Hearing worse with a cold. Hear — but don't understand words. Hear better on clear days. Worse on rainy days. Head noises like crickets, bells, whistles, clicking, escaping steam or many other sounds. If your condition is caused by catarrh of the head, you, too, may likely enjoy such wonderful relief as many others have reported. **WRITE TODAY FOR PROOF AND 30 DAY TRIAL OFFER.**

THE ELMO COMPANY
DEPT. 4P59 DAVENPORT, IOWA

473 MEN WANTED

As Local Manufacturers of this New Masonry

CAVITEX is today's masonry—colorful, streamlined, scientific. Yet with price appeal to override competition. Size and proportion in direct line with modern architectural trends. Dimensions strictly according to modular standards. All the strength, safety and endurance of masonry at its peak point.

Outstanding Opportunities For Responsible Operators

CAVITEX

Cavitex can be made locally—of local materials with local labor. Freight and distribution costs are saved. That's why Cavitex can be sold so low, yet still allow 100% or more mark-up on material and labor. We supply basic equipment on easy rental terms. Exclusive privileges in franchise-protected territories. Hundreds of territories open. Write or wire today for "Opportunity, Unlimited"—free. If requested, we will tentatively reserve territory desired.

W. E. DUNN MFG. CO., 410 W. 24th St., Holland, Mich.

.22 RIFLE BARGAIN

CARBINE STYLE
(BRAND NEW!)
34 inches long
4 lbs.

$14.95

Exclusive with United!

German Featherweight precision made rifle. Simplified rugged construction . . . one screw take down assembly. Has automatic ejector with self adjusting sporting rear sight, blade front sight. Barrel has SIX lands! Blued thru-out. Highly polished bolt action. Genuine walnut stock! Shoots American Longs, Shorts and Long Rifle (regular and high powered). Amazing accuracy at 100 yard range! Replacement parts easily secured if ever needed. Low cost skilled labor makes possible our amazing bargain price. Supply Limited. **10 DAY NO RISK TRIAL.** If not satisfied return for full refund. **Transportation collect.** C.O.D.'s require $2.00 deposit. Mail Orders Only. None sold to minors. **STATE AGE.**
UNITED ARMS CO., 9043 S. Western, Dept. CHOB-2058, Chicago 20.

CASTING SECRETS REVEALED!

Now you can learn how to make big money by casting thousands of perfect plaques, book ends, figurines, etc., with X.L. rubber molds.

NO EXPERIENCE, VERY LITTLE CAPITAL NEEDED.

X.L. Rubber, Pts. $2.50; Qts. $4.00 (postage extra). Molds and enough rubber for three molds, $1.50 prepaid. Send 25c (refunded with order) for informative catalog (40 pages) describing this wonderful, exciting *Profit-making* business.

HUGE PROFITS! MORE MONEY!

PLASTIC ARTS STUDIO 3403 S. MADISON, DEPT. 3 MUNCIE, INDIANA

I'll Send You This Handsome SAMPLE CASE-FREE

and Show You How to Make Up to $15.00 in a Day

Mail coupon for this Free Tailoring Sample Case packed with 150 beautiful, big-value suit and overcoat fabrics. Take orders from friends, fellow-workers, others, for fine quality, made-to-measure clothes. Pocket big cash profits in advance. Because wearing our suits and overcoats brings more orders, we make it easy for you to get your own clothes without 1c cost. No experience is needed. SATISFACTION GUARANTEED. SEND NO MONEY. Just fill out and mail coupon—today!

PROGRESS TAILORING CO., 500 S. Throop Street
DEPT. D-220 - CHICAGO 7, ILLINOIS

PROGRESS TAILORING CO., Dept. D-220
500 S. Throop St., Chicago 7, Ill.

Dear Sir: I WANT A MADE-TO-MEASURE SUIT TO WEAR AND SHOW, without paying 1c for it. Rush details and Sample Kit of actual fabrics, ABSOLUTELY FREE.

NAME.....AGE.....

ADDRESS.....

CITY.....STATE.....

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

32-M DISTRICT NATIONAL BUILDING

WASHINGTON 5, D. C.

You Can Influence Others With Your Thinking

TRY IT SOME TIME. Concentrate intently upon another person seated in a room with you, without his noticing it. Observe him gradually become restless and finally turn and look in your direction. Simple—yet it is a *positive demonstration* that thought generates a mental energy which can be projected from your mind to the consciousness of another. Do you realize how much of your success and happiness in life depend upon your influencing others? Is it not important to you to have others understand your point of view — to be receptive to your proposals?

How many times have you wished there were some way you could impress another favorably — *get across to him or her your ideas?* That thoughts can be transmitted, received, and understood by others is *now* scientifically demonstrable.

This FREE Book Points the Way

The tales of miraculous accomplishments of mind by the ancients are now known to be fact—not fable. The method whereby these things can be INTENTIONALLY, not accidentally, accomplished has been a secret long cherished by the Rosicrucians—one of the schools of ancient wisdom existing throughout the world. Write for the free copy of the fascinating sealed book, "THE MASTERY OF LIFE," which explains how you may receive this unique wisdom and benefit by its application. Address: Scribe B.T.Z.

The ROSICRUCIANS
San Jose, (AMORC) California

USE THIS COUPON

Scribe B.T.Z.
The Rosicrucians
San Jose, California

I am sincerely interested in an intelligent method of attaining a mastership of life. Send me without obligation, your FREE Book which explains how I may receive and use your age-old method.

Name.....
Address.....
City.....

A FEW ¢ MORE INSURES YOU "FAMILY-SAFE" **TIRES** YEAR AFTER YEAR WE SAY—"IT'S DANGEROUS TO PAY LESS."

CHOOSE! "EXTRA DISCOUNT?" or our EXTRA SAFE SERVICE?

GOODYEAR Firestone

GOODRICH U.S. ROYAL ARMSTRONG & OTHERS **1 FREE TUBE** with every good & finest grade tire.

PASS. CAR TIRES $4 no recaps & GUARANTEED TRUCK TIRES $11

BLATTS WORLD-FAMOUS Finest. (NOT RECAPS.)

32 MONTHS GOLDEN RULE GUARANTEE

600-16	$5.05	700-16	$5.85	640-15	$4.72	800-15	$5.95
500-16 (6)	5.90	700-16 (6)	7.16	670-15	5.06	820-15	5.95
650-16	5.64	750-16	8.78	710-15	5.35	850-15	4.95
550-16 (6)	6.79	550-17	4.25	760-15	5.63	700-15	5.25
475-19	4.84	WHITEWALLS $1.50 EXTRA				525-18	4.25

FINEST HEAVY DUTY TRUCK TIRES 32 MONTH GUARANTEE

Fleet Owners Re-Order Year After Year. Not Recaps.

700-15 (6)	$8.73	700-17	$9.83	700-20	$10.76	1000-20	$17.95
750-15	11.73	750-17	11.23	750-20	13.22	1100-20	17.97
750-16 (8)	10.65	600-20	8.64	825-20	18.69	1000-22	17.97
825-15	12.53	32- 6	10.96	900-20	16.49	1100-22	18.25

We select your tires, as if our future depended on it

MILITARY TREAD 32 Month Guar. No Recaps

Buy in Confidence, our fine Slightly Used Tires	750-20	H. Duty	$16.64
	900-16	H. Duty	14.24
	600-16	H. Duty	9.94

Factory Retreed Snow Tires 30 Mo. Guarantee "New Tire Traction", Goodyear, Firestone & Others.
670-15 $7.95 | 600-16 $7.95 | 710-15 | 800-15 | 760-15 | 650-16 | 820-15 | 700-15 $9.90

BLATT order from your nearest store — 11th & SPRING GARDEN ST., PHILA., PA. 2827 N.W. 7th AVE., MIAMI, FLA. — Send ch. or M.O. ORDERS RUSHED

AVIATION

Pays You More With a Schooling at PARKS

NOW! A&E MECHANIC LICENSE COURSE

45-week course, all phases aircraft & engines.

Start Jan. 4, 1954

FLIGHT COURSES—Private, Commercial, Instrument, Instructor, Multi-Engine.

DEGREE COURSES—B.S. degree in 3 yrs. from Saint Louis University—Aero. Engineering, Maint. Engineering, Aero. Administration.

All Parks Schooling Approved for Veterans. Write Today.

PARKS COLLEGE Langley Hall East St. Louis, Ill.

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. Our material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N. Y.

High School at Home

Many Finish in 2 Years

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 56-year-old school. Send for FREE descriptive booklet.

AMERICAN SCHOOL, Dept. H946
Drexel at 58th St., Chicago 37, Ill.
Without obligation, please send FREE descriptive booklet.

Name.....
Address.....

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

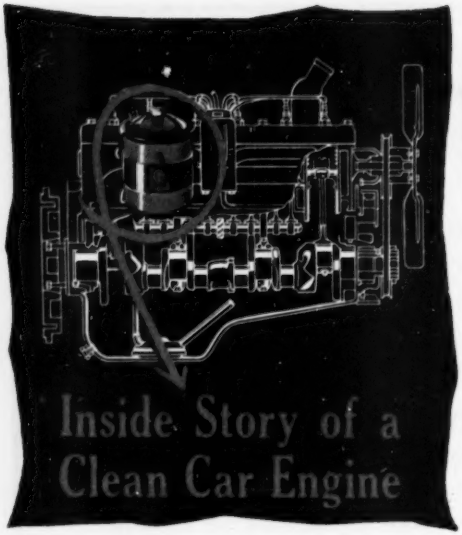
Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • COPYRIGHTS • PATENTS

142-V VICTOR BUILDING, WASHINGTON 1, D. C.



Your engine is built with close tolerances . . . mirror-finished to overcome the friction of high-speed operation. Clean oil keeps it this way to give you maximum pep, power and long life. In modern, high-compression engines, sludge and dirt increase friction . . . sapping engine power and causing excessive wear.

FRAM Cleans the Oil that Cleans the Motor

That's why 20,000,000 engines today are equipped with Fram Oil Filters. Fram-clean engines keep their power longer. Make it a practice with your car to replace the oil filter cartridge regularly. And replace it with a genuine Fram. There's a reason. Fram Cartridges trap more dirt. They even remove invisible dirt. They're engineered to your car manufacturer's specifications. And only Fram Cartridges are guaranteed best you ever bought or your money back.

FRAM FILTERS . . .

Best Life Insurance Your Car Ever Had

Call Western Union (by number) Operator 25 for name of nearest Fram Dealer.

FRAM CORPORATION
Providence 16, R. I.
In Canada: Fram Canada Ltd.
Stratford, Ontario

AIRPLANE WHEEL ASSEMBLIES

These wheel assemblies are all new, and of heavy duty construction. Depending on load desired to carry, they are ideal for House Movers, Farms, Trailers, Carts, Wheelbarrows, etc.

Complete with Wheel, Tire, Tube and Bearings

Size 26:00, 10 ply tire, smooth tread, uses tapered axle size 3 in. x 2½ in. 10½ in. wide. Overall height 26 in. Static Load 6,300 lbs.
Weight 54 lbs., Price $47.50 ea.

Size 5:00 x 4, 6 ply, smooth tread. Uses straight ⅝ in. axle, 3¼ in. wide. Overall height 13 in. Static Load 1,800 lbs.
Weight 8 lbs., Price $12.50 ea.

Size 6 x 2½, solid rubber tire, **heavy duty roller bearing, 6"** high, 2½" wide, 1" straight axle, static load 500 lbs.
Weight 4 lbs. Price $3.50 ea.

Size 17:00, 6 ply, smooth tread. Uses tapered axle, size 2 in. x 1¾ in. 8 in. wide. Overall height 17 in. Static Load 2,000 lbs.
Weight 18 lbs., Price $17.50 ea.

Size 8:00x4, 4 ply, smooth tread—uses straight 1¼ in. axle, 6 in. wide. Overall height 17 in. Static Load 900 lbs.
Weight 13 lbs., Price $27.50 ea.

Size 10½ x 4, 6 ply ribbed tire. Uses straight ⅝ in. axle, 3¼ in. wide. Overall height 10½ in. Static Load 1,200 lbs.
Weight 8 lbs., Price $9.95 ea.

Prices F.O.B. Chicago. Include approx. postage on orders paid for in advance. C.O.D. orders enclose 25%, balance sent C.O.D.

U. A. S. Corp. Dept. PS-12 5637 W. 63rd Pl. Chicago, Ill.

Assemble Your Own **DIVING LUNG**
We furnish the parts and instructions. Complete outfits **$39.95** and **$49.95**
Write for descriptive literature

FREE Catalog! Underwater swimming equipment. Write today!

Assemble Your Own Portable
EMERGENCY OXYGEN OUTFIT
Complete parts and instructions furnished. Outfits from as low as **$5.95** up to **$49.95. Write for literature.**
O Air & Oxygen Tank. For Diving Lungs, etc. 295 cu. in. capacity. 1800 psi. Hydro. tested, current dating. ICC3A1800.
Reconditioned. Wt. 12⅝ lb. F.O.B. St. L. **$10.95**

Ed. Aguado Trdg. Co., Dept. Z, Box 4525 Plaza Sta., St. Louis, Mo.

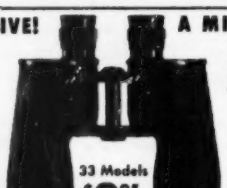
Sample IMPORTS

FROM FOREIGN LANDS—Exciting, useful sample, products from France, Germany, India, etc., sent to you. Established Import-Export firm offers men or women **FREE** plan for big profit, world-wide, mail-order business at home; or travel abroad. No capital or previous experience needed. Overseas bargains bring high U. S. prices. Write today for **FREE** plan!
Mellinger, Dept. 24C, 1717 Westwood, Los Angeles 24, Cal.

Secrets of VENTRILOQUISM Now Revealed!

Easy to learn in 60 to 90 days with our Home Study Course. **RESULTS GUARANTEED.** Make Money! Be Popular! Have Fun! Big Opportunity! Radio, Television, Stage Appearances! For Free Information regarding price and terms, WRITE. You must state your age. Dummy Catalog 25c.
FRED MAHER SCHOOL OF VENTRILOQUISM
Box 36, Studio 12 Kensington Station
Detroit 24, Michigan

GIVE! A MILLION THRILLS!



High Power BINOCULARS
30 DAY FREE TRIAL
Finest Precision Optics
Featherlight
Guaranteed Savings
Money Back Guarantee
Easy Pay Plan
Compare Before You Buy!
Dealer Name on Request.
33 Models $9.95 UP
FREE BOOK & COLOR CATALOG

BUSHNELL *Binoculars* Bushnell Bldg., Dept. P-72 Pasadena 1, Calif.

GIVE! Free! FREE BOOK AND COLOR CATALOG
NAME _____ CITY _____
ADDRESS _____ STATE _____

NOW... get EVERYTHING YOU NEED to prepare to earn REAL MONEY in

TELEVISION

...one of America's BRIGHTEST Opportunity Fields

Enjoy highly interesting work ...and a wonderfully promising future

America's great billion dollar Television field now offers you a chance of a lifetime to get started toward a good job or your own profitable business. With so many new TV stations coming on the air, Television is expected to grow as never before! Millions of TV sets must be produced, tested, installed and serviced. And Television is only *one branch* of this vast opportunity field of Electronics—for which D.T.I.'s amazingly effective training prepares you.

Right in your own home you may now get one of today's most interesting . . . PRACTICAL WAYS to prepare for your start in TELEVISION, including Radio and Electronics. No previous experience or advanced education are needed—because D.T.I. brings you a 3-WAY COMBINATION method that speeds your understanding and progress. You (1) Learn from well illustrated lessons, you (2) Learn by Seeing from D.T.I.'s wonderfully effective home movies and (3) you Learn by Doing from electronic parts that provide the practical experience you need.

You get and KEEP the same type of basic electronic equipment used in our modern Chicago Training Laboratory. You get home training that includes the knowledge and experience gained from training thousands of students first hand. In other words, you get LABORATORY TYPE TRAINING . . . RIGHT IN YOUR OWN HOME. But why not get the whole exciting story. Mail coupon today.

If preferred, you can get ALL of your training in D.T.I.'s CHICAGO LABORATORY . . . one of the nation's finest. Write for details

EMPLOYMENT SERVICE

Get an honest-to-goodness EMPLOYMENT SERVICE to help you get a good job after graduating — or assistance in starting your OWN TV-RADIO SALES & SERVICE BUSINESS.

MILITARY SERVICE

If you're subject to military service, the information we have for you should prove very helpful. Mail coupon today.

EARN AS YOU LEARN

After you get part of D.T.I.'s training, with equipment at home, you may then, in your spare time, begin to earn real money servicing Radio and TV sets.

"One of America's Foremost Television Training Centers"
- Established 1931 -

DeFOREST'S TRAINING, INC.
AFFILIATED WITH
DeVRY *Technical* INSTITUTE
CHICAGO 14, ILLINOIS

300 EXPERIMENTS

Build over 300 fascinating experiments from 16 BIG SHIPMENTS of Electronic-Radio parts which you KEEP. You build and operate Television circuits, Radio receiving circuits, a wireless microphone and many other major projects — all designed to provide outstanding practical experience at home.

HOME MOVIES

Thanks to this exclusive D.T.I. home training aid, many important Television-Radio fundamentals quickly become "movie clear." Now you can actually see electrons on the march and other "hidden actions" — a wonderful advantage that's almost like having a teacher in your home.

BUILD YOUR OWN TEST EQUIPMENT

As part of your home laboratory project you build and keep a quality 5-INCH oscilloscope and a jewel-bearing Multimeter. You will find this equipment ideal for helping you earn in your spare time while a student — and later when working full time in the field.

BUILD AND KEEP A BIG 21" TV SET

For added practical experience, you build and keep this top quality 21 INCH TV Set that provides TV reception at its finest (D.T.I. offers another home training but without the TV set.)

89 WAYS TO EARN MONEY IN TELEVISION RADIO ELECTRONICS

SEND FOR FACTS TODAY!

DeFOREST'S TRAINING, INC.,
2533 N. ASHLAND AVENUE, Dept. PS-12J,
CHICAGO 14, ILLINOIS

I would like your Opportunity Bulletin showing "89 Ways To Earn Money In Television-Radio-Electronics"; also, complete facts about the training opportunities made possible by your organization.

Name _____ Age _____

Address _____ Apt. _____

City _____ Zone _____ State _____

You'll Love the Feel of Its Cushion Bite!

MEDICO

Crest FILTER PIPE $3.50

with Guaranteed BITE-PROOF NYLON BIT

Odorless! Tasteless!

Also available in MEDICO V.F.Q. $2

THROW AWAY NICOTINE

When filter turns brown in Medico, throw it away, with nicotine, juices, flakes, and tars it has trapped. Insert a fresh filter for cooler, cleaner, dryer smoking. Imported Briar.

10 for 10¢

OTHER MEDICO VALUES

Medico Clear-Vue . . . $1.89
Medico Medalist $1.50
Medico Cigarette & Cigar Holders . . . $1.00
Medico Filteretta Disposable Holders, 3 for 25¢

Wide variety of shapes and sizes
Write Medico Pipes, Inc., N. Y. 22, for Booklet R

MAKE EXTRA MONEY

PLASTICS

LEARN AT HOME

LEARN HOW TO MAKE fast-selling PLASTIC NOVELTIES FURNITURE JEWELRY SIGNS TOYS LAMPS

There are RICH OPPORTUNITIES for MEN and WOMEN with "know-how" in Plastics. Interstate's new Plastics course tells and shows how to make hundreds of fast selling items out of Plastics. Gives complete training in fabrication, casting, lamination, molding, internal carving, etc., in simple, easy, step-by-step language and pictures. Plastics and Fabricating Kits for 23 valuable Plastic items come with training at no extra cost. START A PLASTICS BUSINESS OF YOUR OWN. No other industry holds such promise for the future. You can make big money manufacturing novelties, toys, signs, etc., in your own home in spare or full time. Don't wait! Learn NOW how Interstate's Plastics Training qualifies you for success in the Plastics field.

PLASTICS AND SUPPLIES FURNISHED FOR 23 VALUABLE PROJECTS

INTERSTATE TRAINING SERVICE
Dept. C2N Portland 13, Oregon

GRAVELY Snowblower

BLOW YOUR SNOW TROUBLES AWAY!

5 HP

Snow Blower attachment for powerful 5-Horsepower Gravely Tractor moves deep, dangerous snow swiftly and easily. 20 other attachments for every lawn, garden, field job. All-gear drive, reverse. Postcard brings complete story of "Power vs. Drudgery."

FREE! Write Today! →

GRAVELY TRACTORS, INC.
BOX 1284 DUNBAR, WEST VA.

MAKE MONEY 90 WAYS IN PHOTOGRAPHY

If you are OVER 17—good pay, fascinating work await you in photography. Start earning at once as you learn to make money 90 ways with your camera. Our famous, low-cost LEARN-BY-DOING method and INDIVIDUAL guidance train you quickly at home! Write TODAY for FREE catalog. Also Resident Training. 44th Year. GI Approved.

Send for FREE BOOK

NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. S, 10 W. 33 Street New York 1, New York

EASY TO ASSEMBLE

BOAT KITS

30 MODELS

NEW 18 FT. OUTBOARD CABIN CRUISER

Other models 8 to 23 Ft.
Rowboats, Outboards, Inboards

NEW CATALOG Only 35c, SEND COIN TODAY

U-MAK-IT PRODUCTS 703R-WHITTIER ST. Bronx 59, N. Y. City

REAL ESTATE

BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. STUDY AT HOME or in classrooms in leading cities. Diploma awarded. Write TODAY for free book! No obligation.

FREE BOOK TELLS HOW

Approved for World War II and Korean Veterans

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
Suite 300 Law Bldg. Dept. PS Kansas City, Mo.

WATCHMAKING

FREE Sample Lesson

Watch repairing's fun . . . profitable too! An exciting hobby or fascinating career. Chicago School of Watchmaking offers complete home study training in professional watch repairing at amazing low cost. All equipment included at no extra charge. Or, if you prefer, attend school in person, no experience needed. Write today. No obligation.

CHICAGO SCHOOL OF WATCHMAKING

2330 Milwaukee Ave., Dept. 4123, Chicago 47, Ill. ☐ Veteran

Send free sample lesson. ☐ Home study ☐ Resident school

Name _____

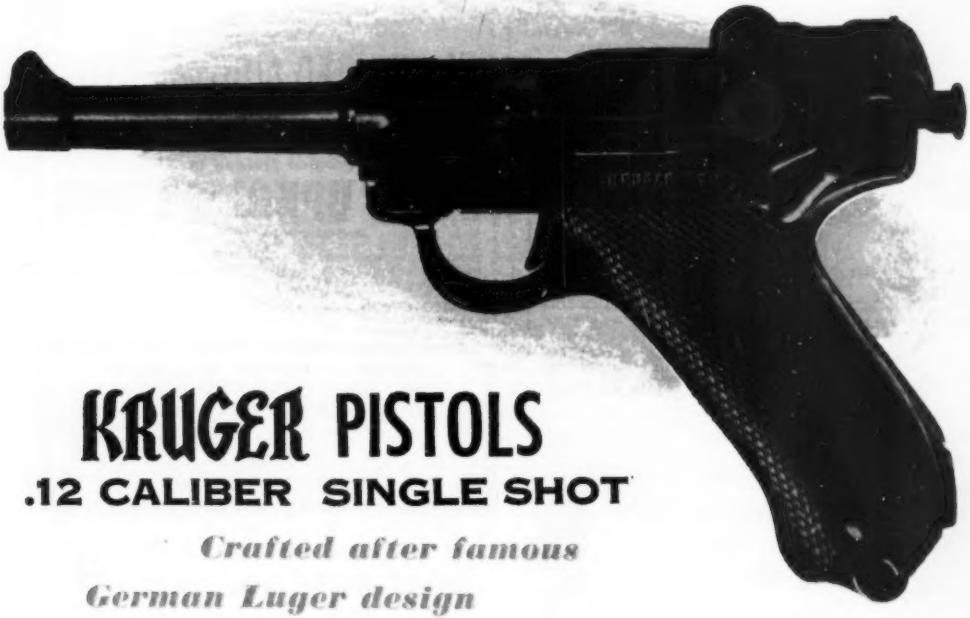
Address _____

City _____ Zone ____ State _____

WHOLESALE!

$3.00 postpaid

FULL PRICE



KRUGER PISTOLS

.12 CALIBER SINGLE SHOT

Crafted after famous

German Luger design

This is not an air or CO_2 gun. The Kruger is a small bore gun that actually shoots .12 caliber lead bullets fired by a .14 mg. powder charge. Beautifully designed—ideal for target shooting. It has a 4-inch steel barrel. Over-all length is 8¾ inches. This amazing low price is due to small bore gun design and direct factory- to-you sales.

The Kruger comes with 50 bullets. Extra bullets are available direct from us or at your local store.

This offer is limited. Special Mail Order price of $3.00 each. YOUR MONEY BACK IF YOU ARE NOT COMPLETELY SATISFIED. Adults only. Send $3.00 in check, cash or money order. Prompt free delivery.

USE HANDY COUPON

KRUGER Corporation

2801 W. Valley Blvd., Alhambra, Calif.

Blue-black finish - Knurled Styrene Stock

KRUGER CORP., Dept. 12, Kruger Building,
2801 W. Valley Blvd., Alhambra, Calif.

Please send.....Kruger pistols at $3 each
Payment of $.....enclosed (Sorry, no COD's)

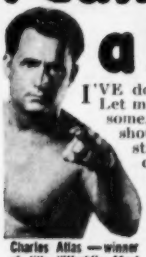
NAME.....

ADDRESS.....

CITY..... STATE.....

LET ME PROVE

I Can Make YOU a New Man!



Charles Atlas —winner of title "World's Most Perfectly Developed Man"

I'VE done it for thousands of other fellows. Let me *prove* I can add solid inches of handsome, rippling muscles to YOUR arms, legs, shoulders, back . . . make *you* an outstanding specimen of strength and self-confidence. My secret of *"Dynamic Tension"* does it in just 15 minutes a day. You'll be amazed at the results and so will your friends.

FREE—My 32 Page Illustrated Book is Yours—Not for $1 or 10c—**But FREE**

5 INCHES OF NEW MUSCLE "My arms increased 1½" chest 2½" forearm 7/8"." C. W., W. Va. "Have put 3½" on chest (normal) and 2¼" (expanded)." F. S., N. Y.

32 pages packed with valuable advice, actual photographs of fellows who became new men almost overnight . . . with *"Dynamic Tension."* Book can mean turning point of your life. It's yours—ABSOLUTELY FREE Send for it TODAY. Address me personally: **CHARLES ATLAS, Dept. 112, 115 East 23rd St., N. Y.**

CHARLES ATLAS, Dept. 112,
115 East 23rd St., New York 10, N. Y.

Send me—absolutely FREE—your famous book, "Everlasting Health and Strength!"—32 pages, crammed with photos, answers to vital questions, valuable advice. I understand book is mine to keep, and sending for it does not obligate me in any way.

Name _____ Age _____
(Please print or write plainly)
Address _____
City _____ State _____

The Electric Shaver for "HE-MAN" BEARDS!

WHISK AWAY EVEN A 7 DAY BEARD WITH THE WHISKER ELECTRIC SHAVER

Precision-built, with .002" thin blade that shaves all beards smoothly, closely.

Whether you shave once a day, or once a week you'll like WhiskER Electric Shaver. Its clipper-like blade is designed for all beards, is definitely less irritating. 110v AC model; no TV or radio interference. See your barber or dealer. If he cannot supply you, send $15.95—we pay postage; or send $2, you pay balance plus postage and COD. 10-day money-back guarantee.

CADET ELECTRIC HAIR CLIPPER

The same fine quality clipper used and sold in many beauty shops. See your shop, or dealer. If you prefer, send $10.95—we pay postage; or $2, you pay postman balance, postage and C.O.D.

ELECTRO TOOL CORP., Dept W533-M, Racine, Wis.

PARTS FOR MILITARY TRUCKS and JEEPS

4 & 6 WHEEL DRIVE. WRITE FOR PARTS CATALOG STATING MAKES.

JEEP TOPS and CURTAINS

All Brand New . . . Not Surplus

Made of Heavy Canvas Duck . . . Waterproof

MILITARY TYPE models. Top and Curtains, complete, less bows **$59.50**

TOP and CURTAINS, HALF CAB . . . MODELS CJ2A and CJ3A, complete with hardware, less bows **$65.00**

TOP and CURTAINS Complete, MODELS CJ2A and CJ3A, with hardware for entire Jeep, less bows **$88.80**

When ordering please state exact model.
All prices FOB K. C., 25% dep. on CODs

JEEP MOTORS

UNITED AUTO PARTS CO. INC
1901 TROOST · GR.1800 · KANSAS CITY, MO.

Men and Women Trained at Home For

Prosperous Business In UPHOLSTERING

Tools, Supplies, everything necessary to get started sent. Illustrated training shows how—progress rapidly. No previous experience necessary. Make over old furniture, sell for many times cost to you. Establish full or part time money making business. Free booklet explains plan. Send name, address to

COMMERCIAL TRADES INSTITUTE
1400 Greenleaf, Dept. UI-12 Chicago 26, Ill.

BUILD LUGGAGE AT HOME WE SELL YOUR PRODUCTS!

Only New Home Money-Making Plan in Years!

Make Luggage and cases for traveling, photographers, musicians, salesmen, electronics, tools, portables, 1001 other items. Also repair Luggage. No special equipment needed. BIG Profits. We supply complete instructions—everything. Write for free details and Business Plan. ABARSI CASECRAFT Dept. C-5, 805 W. Sunset Blvd., Los Angeles 12, Calif.

See Your House Before You Build **$4.95**

HOYT RUST Scale Kit

Make exact model on your plan. A few hours fun will prevent costly mistakes. Colors, finishes, furniture, appliances, instructions, patented clasps included in Kit M-43. Postpaid for $4.95 with order. Or write for description.

HOYT RUST, 173 Marion Street, Denver 18, Colo.

HYPNOTISM

Learn to apply this tremendous POWER. Develop will-power, self-confidence, self-control. ANYONE can master this exciting, profitable profession in short time by training at home, with GUARANTEED RESULTS. DON'T DELAY. . . Write to America's oldest Hypnotic School for free information now—today!

JUST FILL IN COUPON AND MAIL

INSTITUTE OF APPLIED HYPNOLOGY
Dept. 212
120 Central Park South, N. Y. 19, N. Y.
Please send me Free information:

NAME _____
ADDRESS _____
CITY _____ STATE _____

Picture yourself going places

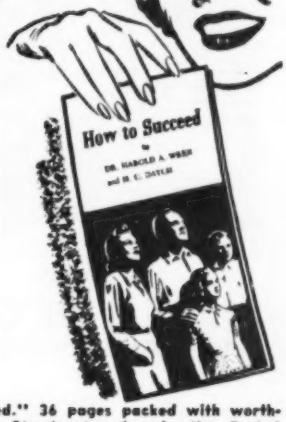
You've done it often. Call it day-dreaming if you like, but you've seen yourself in a bigger job — giving orders and making decisions — driving off in a smart new car — buying your family a fine home.

There's nothing wrong with dreams. But how about making them come true? *You can do it*, if you're willing to try!

Look around you. The men who are going places are the *trained* men. They've learned special skills that bring them better jobs and higher pay. It's the men *without* training whose dreams never come true.

What are you going to do about it? Just wait and wish? If you really *want to succeed*, you can get the training you need by studying at home in your spare time. International Correspondence Schools offer you a course in just about any field you choose, giving you the practical plus the bedrock facts and theory. No skimming or skimping! And you'll be earning while you learn. Students report better jobs and more pay within a few months.

Look over the list of subjects in the coupon below. Pick out the one that interests you most — the one that holds the greatest future for you. Then mark the coupon, and mail it today. *Find out* what I. C. S. can do for you. It costs only a stamp or postcard, but it's the first step if you want to go places!



SMARTEST THING HE EVER DID

"I noticed that the trained men held the better jobs. That's when I decided to take an I. C. S. course. Enrolling with I. C. S. was one of the smartest things I ever did. The position as Plant Engineer I hold today is largely due to the 'know-how' derived from my I. C. S. texts. I. C. S. can help any man who will study."

L. P. S., Elkhart, Ind.

FREE BOOK "How to Succeed." 36 pages packed with worthwhile success tips. Step-by-step plan of action. Pocket size edition. Absolutely free. Send coupon below.

I.C.S.—the lifetime Christmas gift

I. C. S., Scranton 9, Penna.

INTERNATIONAL CORRESPONDENCE SCHOOLS ICS

BOX 7666-N, SCRANTON 9, PENNA.

Without cost or obligation, send me "HOW to SUCCEED" and the booklet about the course BEFORE which I have marked X:

ART
- ☐ Commercial Art
- ☐ Magazine Illustrating
- ☐ Fashion Illustrating
- ☐ Cartooning
- ☐ Sketching and Painting
- ☐ Show Card and Sign Lettering

AUTOMOTIVE
- ☐ Automobile, Mechanic
- ☐ Auto Elec. Technician
- ☐ Auto Body Rebuilding and Refinishing
- ☐ Diesel—Gas Engines

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft Engine Mechanic
- ☐ Airplane Drafting

BUILDING
- ☐ Architecture
- ☐ Arch. Drafting
- ☐ Building Contractor
- ☐ Estimating
- ☐ Carpenter and Mill Work
- ☐ Carpenter Foreman
- ☐ Reading Blueprints
- ☐ House Planning
- ☐ Plumbing
- ☐ Heating
- ☐ Painting Contractor
- ☐ Air Conditioning
- ☐ Electrician

BUSINESS
- ☐ Business Administration
- ☐ Certified Public Accountant
- ☐ Bookkeeping and Accounting
- ☐ Office Management
- ☐ Stenography and Typing
- ☐ Secretarial
- ☐ Federal Tax
- ☐ Business Correspondence
- ☐ Letter-writing Improvement
- ☐ Personnel and Labor Relations
- ☐ Advertising
- ☐ Retail Business Management
- ☐ Managing Small Business
- ☐ Ocean Navigation
- ☐ Sales Management
- ☐ Short Story Writing
- ☐ Creative Salesmanship
- ☐ Traffic Management

CHEMISTRY
- ☐ Chemical Engineering
- ☐ Chemistry
- ☐ Analytical Chemistry
- ☐ Petroleum—Nat'l Gas
- ☐ Pulp and Paper Making
- ☐ Plastics

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping
- ☐ Structural Drafting
- ☐ Highway Engineering
- ☐ Reading Blueprints
- ☐ Construction Engineering
- ☐ Sanitary Engineering

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Structural Drafting
- ☐ Sheet Metal Drafting
- ☐ Ship Drafting
- ☐ Mine Surveying and Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrician
- ☐ Electrical Maintenance
- ☐ Electrical Drafting
- ☐ Electric Power and Light
- ☐ Lineman

HIGH SCHOOL
- ☐ High School Subjects
- ☐ Mathematics
- ☐ Commercial
- ☐ Good English

MECHANICAL AND SHOP
- ☐ Mechanical Engineering
- ☐ Industrial Engineering
- ☐ Industrial Supervision
- ☐ Foremanship
- ☐ Mechanical Drafting
- ☐ Machine Design-Drafting
- ☐ Machine Shop Practice
- ☐ Tool Design
- ☐ Industrial Instrumentation
- ☐ Machine Shop Inspection
- ☐ Reading Blueprints
- ☐ Toolmaking
- ☐ Gas—Electric Welding
- ☐ Heat Treatment—Metallurgy
- ☐ Sheet Metal Work
- ☐ Sheet Metal Pattern Drafting
- ☐ Refrigeration

POWER
- ☐ Combustion Engineering
- ☐ Diesel—Electric
- ☐ Electric Light and Power
- ☐ Stationary Steam Engineering
- ☐ Stationary Fireman

RADIO, TELEVISION COMMUNICATIONS
- ☐ Practical Radio—TV Eng'r'ing
- ☐ Radio Operating
- ☐ Radio and TV Servicing
- ☐ Television—Technician
- ☐ Electronics
- ☐ Telephone Work

RAILROAD
- ☐ Locomotive Engineer
- ☐ Diesel Locomotive
- ☐ Air Brakes ☐ Car Inspector
- ☐ Railroad Administration

TEXTILE
- ☐ Textile Engineering
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Carding and Spinning
- ☐ Warping and Weaving
- ☐ Loom Fixing ☐ Throwing
- ☐ Finishing and Dyeing
- ☐ Textile Designing

Name_____ Age_____ Home Address_____

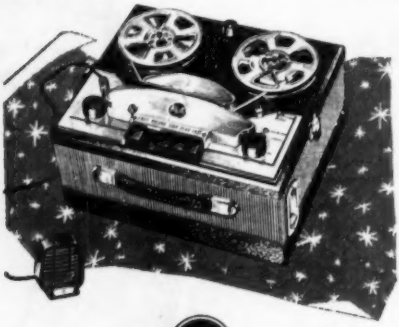
City_____ Zone_____ State_____ Working Hours_____ A.M. to P.M._____

Occupation_____

Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

You'll be glad you gave the RCA Tape Recorder

No other gift gives more than the RCA PUSH-BUTTON Tape Recorder. During the Christmas season—throughout the year—you'll use it again and again to remember family, friends, good times and important occasions. Try the *easy*, PUSH-BUTTON action . . . hear its true-to-life tone at your RCA Dealer's.



RCA ®

RADIO CORPORATION of AMERICA

"I'M MAKING MORE THAN $1000 a Month Haven't Touched Bottom Yet!"

C. KAMA

—reports Charles Kama, Texas, one of many who are "cleaning up" with orders for PRESTO, Science's New Midget Miracle Fire Extinguisher. So can YOU!

Science's New Midget Miracle "PRESTO"

AMAZING new kind of fire extinguisher. Tiny "Presto" (about size of a flashlight!) does job of bulky extinguishers that cost 4 times as much, are 8 times as heavy. Ends fires fast as 2 seconds. Fits in palm of hand. Never corrodes.

Guaranteed 20 years! Almost 2 million sold! Sells for Only $3.98

Show it to civil defense workers, owners of homes, cars, boats, farms, etc. and to stores for re-sale—make good income. H. J. Kerr reports $20 a day. Wm. Wydallis, $15.20 an hour. Write for FREE Sales Kit. No obligation. **MERLITE INDUSTRIES, Inc., Dept. 1112, 201 East 16th St., New York 3, N. Y.** *IN CANADA: Mopa Co., Ltd., 371 Dowd St., Montreal 1, P.Q.*

(If you want a regular Presto to use as a demonstrator, send $2.50. Money back if you wish.)

WRIST CIGARETTE LIGHTER

Fits wrist like a fine watch

for GIFT Giving

America's most unique and practical double feature lighter arrangement. Beautiful high quality, imported, gleaming chrome finish wrist cigarette lighter, mounted on matching full wrist or 2-pc. expansion band. Just attach lighter on one side and your watch on the other side. Men and women owners marvel its perfect performance. Just press once and lid opens; press again and . . . it lights — *never fails!* Strikingly different and popular! Also unique for GIFT-giving! And, ONLY $4.95 ppd., plus *FREE* miniature table lighter (shown). No C.O.D.'s. Money-back guarantee. *Indicate choice of band in order!*

MANSHOLT NOVELTIES
2156 S. 40th St., San Diego, Calif.

GET INTO ELECTRONICS

You can enter this uncrowded, interesting field. Defense expansion, new developments demand trained specialists. Study all phases radio & electronics theory and practice: TV; FM; broadcasting; servicing; aviation, marine, police radio. 18-month course. Graduates in demand by major companies. H. S. or equivalent required. Begin Jan., March, June, Sept. Campus life. *Write for catalog.*

VALPARAISO TECHNICAL INSTITUTE
DEPT. 503 VALPARAISO, INDIANA

FREE 11 HITLER STAMPS

Eleven colorful Hitler stamps—**all different**, all sought-after—sent FREE to secure names for our mailing list. We'll also include other interesting offers for your inspection—PLUS a FREE copy of our fascinating, "How to Collect Stamps." Supply limited, so rush name, address, and 10c to help cover actual postage and handling costs. Address:

Littleton Stamp Co., Dept. 12-PS, Littleton, N.H.

MASTER MIND!

Learn Short-Cut Mathematics

Juggle figures, do baffling number tricks. Make people gasp at your marvelous *lightning-quick* mind. Multiply 4 figures by 4 figures without using old-fashioned multiplication! Big cloth-bound volume: fully illustrated course for self-instruction.

Sharpen up Your Brain Power

Includes worked-out problems, answers, etc. Sensational bargain, only $2.95, postpaid or COD plus postage. Satisfaction guaranteed or refund. Order this amazing "Short-Cut Mathematics" today!

NELSON-HALL CO., 210 S. Clinton St.
Dept. 4MX-1 Chicago 6, Ill.

$2.95 Complete

MODERN

LAWN MOWER SHARPENER

Service departments of leading Lawn Mower manufacturers use the Modern Lawn Mower Sharpener. One lever moves lawn mower into grinding position. Gasoline and oil remain in engine while sharpening, no dismantling of wheels, roller or handle. The Modern is a precision bed knife grinder—no extra grinder to buy. Imitated but never equaled—Compare before you buy.

WRITE FOR FREE BOOKLET 11D

$263.00 with motor F.O.B. PASADENA

If it isn't a Modern it can't be Modern

(Prices subject to change without notice)

MODERN MFG. CO.
160 N. Fair Oaks - Pasadena 1, Calif.

"What's he got that I haven't got?"

LOOK at the successful men you know. "What have they got" that you haven't?

Very little, probably. In most ways these men are no brighter or naturally more capable than average. Many of them probably have no more formal education or better natural aptitudes than you.

But that little extra they have is important. They have the special knowledge and ability for which business is glad to pay well—they know the what, why and how of business. They have also the confidence and aggressiveness which come from knowing that they know and can apply their knowledge.

You may add that extra—may get that same profitable knowledge and ability—that same confidence and aggressiveness—if you are willing to pay the price in earnest, necessary study. For LaSalle has spent over 40 years developing, testing and proving, with over a million student members, spare-time success training in certain specialized business fields. What scores of thousands of men and women—many just like you—have done, you should be able to do.

You need not leave your home or interrupt your job; you need pay comparatively little money. But you must be ambitious and willing to study seriously. And soon after you start training, the results will begin to show up in your own confidence and in your work. For what you learn at home tonight is so practical that often you can apply it on the job tomorrow.

How much do you want success—more money, a promotion or a new job, prestige and responsibility? If you really want it, you will use this coupon to find out what LaSalle training can do for you. It costs only a postage stamp, but a coupon like it has been the starting point to real success for scores of thousands—and can be for you.

LASALLE EXTENSION UNIVERSITY
A Correspondence Institution
Dept. 1283-R • 417 S. Dearborn • Chicago 5, Ill.

I want to know how LaSalle can help me win success in the field I have checked below. Please send me your free 48-page booklet about that field and your success training in it—plus "Ten Years' Promotion in One," a book which has helped many men.

- ☐ Higher Accountancy
- ☐ C.P.A. Coaching
- ☐ Bookkeeping
- ☐ Law: LL.B. Degree
- ☐ Business Management
- ☐ Salesmanship
- ☐ Traffic Management
- ☐ Foremanship
- ☐ Industr'l Management
- ☐ Stenotypy (Machine Shorthand)

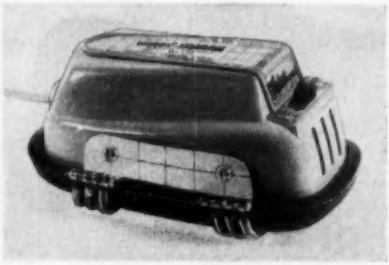
Name.....*Age*.....

Address.....

City, Zone and State.....

LASALLE EXTENSION UNIVERSITY
A Correspondence Institution

Dept. 1283-R 417 So. Dearborn St.
Chicago 5, Ill.



VITALIZER

A PROFESSIONAL TYPE ELECTRIC VIBRATOR FOR USE IN THE HOME!

At last—a really fine Vibrator that's within the reach of everyone! Now you can enjoy the wonderful Swedish rotary-type massage that makes tired, aching muscles feel so good and is so good for you!

● Just slip VITALIZER over your hand; flexible spring straps, mounted on comfortable sponge rubber cushion, adjust to fit any hand. Flick the handy on-off switch. Thousands of vital massage pulsations pass through your finger tips to arms, legs, body, scalp . . . help stimulate circulation, relieve fatigue, tone up muscles.

● The pressure of your fingers determines the degree of massage . . . gentle or vigorous. VITALIZER is lightweight, beautifully designed, precision-engineered for years of service and enjoyment. Pleasant, easy to use—and amazingly low in price for a quality massage instrument.

● **Only $9.95,** plus 50c insured postage and handling. AC only. 6' cord. Fully guaranteed, of course. **Order now!**

HUGH CLAY PAULK
304 Kansas Ave. Dept. S-10 Topeka, Kans.

BENJAMIN SUPER CO_2 GAS PISTOL

BE SURE! Get a full scale drawing FREE . .

MOST POWER
LOWEST PRICES!
SAFE ● NON-TOXIC ● ACCURATE
ECONOMICAL ● CONVENIENT

Easy to operate—Uses low cost Soda Cartridges. Cal. .22 or Cal. .177 Benjamin H-C Pellets & Darts or BB. Write Today for Illustrated Folder of All Models Benjamin Air Rifles and Benjamin Air Pistols.

$13.50 Up

NEW BENJAMIN GAS RIFLE AVAILABLE SOON

BENJAMIN AIR RIFLE CO., 852 Marion St., St. Louis 4, Mo., U.S.A.

FREE

7 Days Use of Practical Book "BASIC HOME CARPENTRY" Shows How to Save Money on 1,001 Jobs Around the House!

320 idea-filled pages and 500 show-how pictures, plans and diagrams make every carpentry job easy—from building a tool box to adding a new wing to your house. Over 175,000 copies sold! Use it 7 days FREE. If delighted, remit only $1.95 plus few cents postage. Or return the book and pay nothing. Send no money! Just mail post card to WM. H. WISE & CO., Inc., Dept. 812, 50 West 47th Street, New York 36, N. Y.

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION, You should take steps to protect it by a U. S. Patent. Write me for "INVENTION RECORD" FORM

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 35th FLOOR, 123C
NEW YORK CITY

INVENTORS

I shall be pleased to furnish you, upon request, with information relative to patent procedure—without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

INVENTORS

Send for **PATENT INFORMATION** Book and **INVENTOR'S RECORD** without obligation

GUSTAVE MILLER
123-PS Warner Building
Washington 4, D. C.

REGISTERED PATENT ATTORNEY
PATENT ATTORNEY & ADVISOR
U. S. NAVY DEPT. 1930-1947
ASSOCIATE EXAMINER
U. S. PAT. OFF. 1922-1929
PATENT LAWYER

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.

PATENTS

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
426 SNOW BUILDING, WASHINGTON 1, D. C.

Inventors

The following are the usual preliminary steps to take toward patent protection.

Make a disclosure of your invention; sign, date and have this document witnessed by two or more people who understand your invention; authorize your registered patent attorney or agent to conduct a preliminary search among previously granted U. S. patents for similar types of invention; secure a report on the probable patentability of your invention and a recommendation of the further course to take.

We shall be glad to send you without obligation our instructive booklet, "Patent Protection for Inventors" and our "Evidence of Invention" disclosure form.

VICTOR J. EVANS & Co. *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
840-P MERLIN BUILDING, WASHINGTON 6, D. C.

I'll Train YOU at Home in Your Spare Hours for Big Pay Job • Your Own Business • Exceptional Opportunity in

RADIO-TELEVISION

ON *New* NO-OBLIGATION PLAN!

I Send You **18 BIG KITS** OF RADIO-TELEVISION EQUIPMENT

Approved for Veterans Under the G. I. Bill

IF YOU ARE EXPERIENCED IN RADIO Men already in Radio who seek a short intensive 100% TELEVISION Training with FULL EQUIPMENT INCLUDED are invited to check and mail the coupon at the right.

You Have NO MONTHLY PAYMENT CONTRACT

to sign... you pay for your training as you learn and earn... ENROLL NOW!

Be Ready in Little as 10 MONTHS!

Now you can get into Radio-Television, today's fastest growing big money opportunity field, in months instead of years! My completely new "package unit" training plan prepares you to qualify as a Radio-Television Technician in as short a time as 10 months, or even less! I offer you my training with no monthly payment contract to sign—thus NO RISK and NO OBLIGATION for you! This is America's finest, most modern and really practical training. Includes FM . . UHF Television and all the most recent developments. My training gets you ready to handle any practical job in the booming Radio-Television industry. Start your own profitable Radio-Television Service Shop . . . or accept a fine paying job. I have trained hundreds of successful Radio-Television technicians—and I can train you regardless of lack of previous experience. Mail coupon and get all the facts—FREE!

VALUABLE EQUIPMENT INCLUDED WITH TRAINING

Much of your Sprayberry Training is actual construction, demonstration and experimentation. You get priceless practical experience this way. You build the 6 tube Sprayberry Short Wave and Broadcast Training Radio Receiver, the Sprayberry Television set, multi-range test meter, signal generator, signal tracer, cathode ray oscilloscope and many other projects. All this equipment is yours to keep. You have practically everything you need to set up your own profitable Radio-Television shop. All lessons and books I send you remain your own property.

OUR 21st YEAR TRAINING MEN FOR RADIO-TELEVISION

Earn Extra Money While You Learn

All your Sprayberry Training is given IN YOUR OWN HOME during your free time. Keep on with your present job and income while learning Radio-Television. With each Sprayberry "Package Training Unit" I include money-making plans and special "Business Builders" for spare time Radio-Television service jobs. New Television stations opening everywhere open big money opportunity for men to install UHF antennas—I tell you how! If you expect to be in the Armed Forces later, there is no better preparation than Radio-Television. Mail coupon below . . . get facts FREE. *No salesman will call.*

FREE TO YOU 3 BIG RADIO-TELEVISION BOOKS

I invite you to get all the facts—

I want you to have ALL the facts—without cost! Rush coupon for my three big Radio-Television books! "How to Make Money in Radio-Television" PLUS my new illustrated Television Bulletin PLUS an actual sample Sprayberry Lesson—ALL FREE. No obligation and no salesman will call. Mail coupon!

SPRAYBERRY ACADEMY OF RADIO
Dept. 55-D, 111 North Canal Street
Chicago 6, Illinois

Mail Coupon Today!

NO OBLIGATION
No Salesman Will Call

SPRAYBERRY ACADEMY OF RADIO
Dept. 55-D, 111 N. Canal St., Chicago 6, Ill.

Please rush to me all information on your 10-MONTH Radio-Television Training Plan. I understand this does not obligate me and no salesman will call. Include 3 books FREE.

Name..... Age.....

Address.....

City..... Zone... State.....

☐ Are you Experienced? ☐ No Experience

"ONE-MAN" BUSINESS OPPORTUNITY
FREE Confidential Facts...

MIRACLE **new** SCREEN PRINT

printing secret

At Last FABULOUS TRADE SECRETS of this new revolutionary printing method are available. Print big quantities of expensive advertising displays, banners, posters, labels, wallpaper, novelties, etc., at SMALL COST—but BIG PROFITS—NO COSTLY EQUIPMENT!

EARN $10 PER HOUR IN SPARE TIME

PRINT WITHOUT A PRINTING PRESS

Learn new method—costs LESS to print (10, 50, 100, sometimes 1,000 quantities—in full color) than on regular printing presses costing over $10,000. Means you can CHARGE LESS and EARN MORE money on printing jobs THAN WITH A FULLY EQUIPPED PRINTING SHOP Amazing!—but true. It's about to revolutionize the entire printing industry Investigate—BE FIRST!

START YOUR OWN BUSINESS—ON A "SHOE-STRING"—COMBINE spare time and printing secrets and EARN dollars in profits on every job. Easy to learn—no experience needed. Be your own boss. We supply everything, including step-by-step illustrated instructions, supplies, business plan, etc.—without you risking one cent. WE MUST HAVE REPRESENTATIVES ALL OVER THE U.S. IMMEDIATELY!

YOUR HOME, GARAGE, BASEMENT IS YOUR WORKSHOP. Materials for some $100 jobs cost you less than $10.00 You DON'T print cheap stationery, form letters, etc.—you print EXPENSIVE beautiful signs, banners, etc.—"Custom" jobs needed by every business. No selling because you

HELP SUPPLY HUGE DEMAND IN YOUR AREA from shops, stores, theaters, markets, churches, clubs—all kinds of businesses that often must send hundreds of miles away for this specialized work. ACT NOW! TODAY! Don't lose this "chance of a lifetime" opportunity. Airmail reaches us overnight. Costs you nothing to investigate! DON'T DELAY! RUSH name and address to:

OTHERS SAYING— "First attempt netted $40" J. B. Canada. "Swamped with orders" R. T. Florida. "Works like a charm" F. M. Mo. "Making 75% of boasting expenses already spare time" E. L. Ontario. "Would not take $1000 for secrets" C. S. Nevada. "Made $80 first week," terrific opportunity!

FREE! Revealing DETAILS real confidential SAMPLES exciting Business PLAN etc. —Send NO money!

Write

SCREEN PRINT OPPORTUNITIES Dept. IC
1010 S. Los Angeles St., Los Angeles 15, Calif.

LOW OVERHEAD—LARGE VOLUME SALES & SMALL PROFITS
BRING YOU THESE "LOWEST PRICES"
WHAT GOOD IS A TIRE WITHOUT A TUBE?

TUBE GIVEN WITH EVERY TIRE AT NO EXTRA COST

20 YEARS AT THIS ADDRESS

An established Policy of Careful selection, assures you many happy miles. Be wise—try one—you'll buy More! We welcome competition, NO ONE can touch our quality & price!

WHY PAY MORE?

FALL SPECIALS—AT LOW PRICES

GOOD USED TIRES NOT RECAPS SEND THIS AD

YOU GET WHAT WE ADVERTISE

EVERYBODY MAY TAKE **10% off** ON EVERY TIRE

20 MONTHS WRITTEN GUARANTEE

600-16	$3.55	820-15	$4.95	600-20	$6.65	32x6(8)	$8.15
650-16	4.15	700-15	3.95	650-20	7.15	32x6(10)	9.15
700-16	4.45	670-15	3.95	700-20	7.95	900-20	13.35
650-15	3.95	710-15	4.35	750-20	7.95	1000-20	13.35
760-15	4.4'	150-17	4.55	125-20	12.95	1100-20	13.35

EXTRA SPECIAL 30 MONTH WRITTEN GUARANTEE—FREE TUBE

600-16	$5.25	175-19	$5.45	700-15	$8.65	700-20	$10.95
600-16(6)	6.75	640-15	4.95	750-16(8)	9.45	750-20(10)	14.25
650-16	5.75	670-15	5.35	700-17	9.85	750-20(8)	13.45
650-16(6)	7.25	710-15	5.45	750-17	11.75	825x20	17.95
700-16	6.35	760-15	5.95	750-15	11.05	900-20	17.95
750-16(6)	8.45	800-15	6.35	625-15	12.95	1000-20	16.95
550-18	5.05	820-15	6.35	600-20	8.45	1100-20	17.95
550-17	4.75	550-15	5.35	650-20	9.95	1000-22	18.15
650-15	5.25	670-16	5.15	32x6(8)	10.85	1100-22	20.35
700-15	5.35	700-16(6)	7.25	32x6(10)	13.25	1100-24	20.75

ALL WHITE WALLS $1.00 EXTRA — Military Treads 750x20 $14.05

Thousands of tires shipped all over U. S. A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. S.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

Watch Repairing Pays Big Money **Learn at home**

Watch repairers in great demand. Train step-by-step in 10 easy lessons. We furnish all tools and 15 jewel watch and practice movement. Turn spare time into cash. A licensed school. Low cost. Send for FREE book today.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870 Elston Ave., Dept. PS123, Chicago 18, Ill.

BOAT KITS

Models from 39.25 complete
- Assemble your own boat
- No experience necessary
- Save 1/2 to 2/3 "factory built" prices
- Prices include freight and paint

Free Catalog of all models

12 ft. model pictured

Marine hardware & complete accessories

LUGER INDUSTRIES Marine Division 3207 FREMONT AVE. SO. MINNEAPOLIS 8, MINN.

FUN TO DO . . . PROFITABLE TOO!

LEATHERCRAFT

Textile Painting • Shellcraft
Beadcraft • Metal Tooling
Lamp Shade Making
Other Crafts

Send for BIG, FREE Catalog Today!

Complete supplies, everything you need

KIT KRAFT, Dept 34 7373 Melrose Ave. Hollywood 46, Calif

---

find Hidden Treasure ...and METAL

with The Model 100 Metal Detector

- ULTRA SENSITIVE!
- BATTERY OPERATED!
- WEIGHS 5 POUNDS!
- EASY TO OPERATE!

DETECTS any metallic or magnetic objects hidden in all nonmetallic materials. Distinguishes metal from magnetic materials. Locates buried treasure, pipes, cables and metal deposits. Protects your products, employees and profits by detecting tramp metal in lumber, plastics, food, etc.

The Model 100 Metal Detector is available as factory-assembled, tested unit at $79.90; in kit form, $39.90. Kit includes step-by-step construction procedure illustrated by clear diagrams, tubes, batteries, transformer, headphones, coils and all other components; no drilling or machining required—**nothing more to buy.** Guaranteed—**order today.** Prices f.o.b. Washington. Remit 25% with C.O.D. orders. Canadian orders add 5%; send full payment to:

ELECTRONIC APPLICATIONS, Inc.
Dept. M, P.O. Box 4975, Washington 8, D. C.

Literature on request

PAGE Garden Tractors

1954 line now ready — low prices!

Ruggedly built riding and walking models, 2 to 6 HP All gear drive with reverse, no belts or chains Plow, till, harrow, disc, spray, remove snow, do dozens of other farm and home chores Also new 'Bantam' one-wheel model

Fully Guaranteed

Low prices — easy terms

Free Catalog Shows over 60 attachments!

PAGE does every job faster — cheaper!

PAGE 1916 S. 81st Street MILWAUKEE, WISC.

START YOUR FUTURE TODAY!

Get the facts on NATIONAL SCHOOLS' famous Shop-Method Home Training!

RADIO-TELEVISION & ELECTRONICS

A BRIGHT FUTURE awaits you in booming Radio-TV industry. More than 100 million radio sets, 20 million TV sets, now in use! Backed by National Schools' famous Shop-Method Training from America's Radio-TV Capital you can command good wages in the opportunity-career of your choice—engineer, service-repair, inspector, designer—in radar, electronics—or your own profitable business! Make that bright future come true . . . start now!

WE GIVE YOU COMPLETE PARTS, INCLUDING HIGH-MU TUBES! Yours to keep. You learn by doing, actually build generators, R-F oscillators, and this big Super-Het receiver!

WE GIVE YOU THIS STANDARD PROFESSIONAL MULTITESTER! Locates trouble, adjusts delicate circuits—a valuable profit-earner for you when you become a qualified Radio-TV technician!

LEARN HOW YOU TOO CAN EARN TOP MONEY IN THESE BOOMING INDUSTRIES!

LET NATIONAL SCHOOLS of Los Angeles, California, a Resident Technical Trade School for nearly half a century, train you at home for a high-paying future in these big-future industries.

Earn While You Learn!

Make extra money repairing friends' and neighbors' cars, trucks, radios, TV sets, appliances. Every step fully explained and illustrated in National Schools' famous "Shop-Tested" lessons. Latest equipment and techniques covered. You master all phases—start part-time earnings after a few weeks!

YOU RECEIVE FRIENDLY GUIDANCE, both as a student and graduate. Our special Welfare Department is always at your service, to help you with technical and personal problems. You receive full benefit of our wide industry contacts and experience.

DRAFT AGE? National Schools training helps you get the service branch, and higher pay grade you want.

APPROVED FOR G. I. TRAINING

These courses also offered in Spanish and Portuguese

AUTOMOTIVE-DIESEL & ALLIED MECHANICS

EXPANDING AUTO-DIESEL INDUSTRY needs more and more trained men! 55 million vehicles now operating, 6 million more this year—plus 150,000 new Diesel units! Garages, car dealers, transit lines, defense plants, manufacturers, are desperate for the kind of *trained specialists* produced by National Schools' "Shop-Method Home Training." Start *now* on the road to lifetime security. Mail the coupon today!

WE GIVE YOU THE TOOLS OF YOUR TRADE! This fully-equipped, all-metal Tool Kit is yours to keep. We also give you a complete set of precision drawing instruments, and Slide Rule. These professional tools help you learn, then *earn!*

NATIONAL SCHOOLS

Technical Trade Training Since 1905

LOS ANGELES 37, CALIFORNIA

In Canada: 811 West Hastings Street Vancouver 4, B. C.

Both Home Study and Resident Courses Offered

FREE! RADIO-TV BOOK & LESSON!

FREE! AUTO-DIESEL BOOK & LESSON!

MAIL COUPON NOW START YOUR HIGH-PAYING FUTURE TODAY!

GET FACTS FASTEST! MAIL TO OFFICE NEAREST YOU!

(mail in envelope or paste on postal card)

NATIONAL SCHOOLS, Dept. C-123

4000 S. Figueroa Street Los Angeles 37, Calif. or **323 West Polk Street Chicago 7, Ill.**

Please rush *Free* Book & Sample Lesson checked below. No obligation, no salesman will call.

☐ *"My Future in Radio-Television & Electronics"*

☐ *"My Future in Automotive-Diesel & Allied Mechanics"*

NAME _____ BIRTHDAY ____ 19 ____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

☐ Check here if interested in Resident School Training at Los Angeles.

VETERANS: Give Date of Discharge _____

Enjoy New Driving Comfort with the Sensational

AIR LIFT

PNEUMATIC SPRING BOOSTER

Front AIR LIFTS are specifically designed to give you new driving comfort. They dampen the suspensions, cushion the bumps and eliminate costly repairs.

You'll appreciate the ease with which you can drive the roughest roads and the severest turns with AIR LIFTS to steady your car.

For comfort; stability and safety install AIR LIFTS in your FRONT coil springs. To assist your rear springs . . . if you are carrying overloads . . . use REAR AIR LIFTS. Installation is simple . . . nothing to dismantle . . economical and guaranteed.

AIR LIFT

See Your Dealer Today or Write to:

AIR LIFT CO.
2330 W. Main Street
LANSING, MICHIGAN

What Kind Of A Man Are You?

Weak, frail, without energy and ambition? If you are undeveloped, run-down, with all sorts of complaints hindering you, whether a victim of *physical excesses, overwork, worry, drugging, alcoholism, tobacco, over-stimulation or youthful errors,* then it is high time for you to act.

STRONGFORT

STRONGFORTISM

The world-renowned modern science has fulfilled its mission in America and Europe for hundred thousands of just such men and women, who adopted the principles of this real revelation and who found supreme health, strength and organic stability.

If you need such help, write for the enlightening booklet "PROMOTION AND CONSERVATION OF HEALTH, STRENGTH AND MENTAL ENERGY" today. Please enclose $1.00 for expenses and immediate airmail reply to the

LIONEL STRONGFORT INSTITUTE
MUNICH 50 · BAVARIA · DEPT. 6W
Germany, American Zone

U. S. Patents
No. 2,351,906
No. 2,461,872

Save Fingers with Steel-Grip Finger Guards

Lower Your Hand Protection Cost

To be Sure of the Genuine Demand This Trade Mark

Hundreds of factories save time and injuries by protecting workers with Steel-Grip Open End Finger Guards. For handling rough, sharp particles, buffing, grinding, sanding, punch press work, and hundreds of other jobs. Protect fingers or thumbs, front or back, from cuts, abrasions or blisters. Various designs in leathers and other materials; elastic web back for snug, cool, comfortable fit. Sizes for men and women. Send 10¢ for sample. *Catalog of Safety Apparel Free.*

INDUSTRIAL GLOVES COMPANY
A Corporation
1425 Garfield St., Danville, Ill.
(In Canada, Safety Supply Co., Toronto)

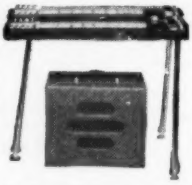
FAMOUS INDUSTRIAL SAFEGUARDS SINCE 1910

"How to MAKE MONEY with Simple CARTOONS"

A book everyone who likes to draw should have. It is free; no obligation. Simply address

FREE BOOK

CARTOONISTS' EXCHANGE
Dept. 1912D Pleasant Hill, Ohio



WHOLESALE

ELECTRIC GUITARS
HEARING AIDS

accordians, amplifiers, double-necks, triple-necks, pick-up mikes, mandolins, non-electric instruments, etc.

1954 MODELS WHOLESALE FREE CATALOG

Specify Catalog, Musical Instruments or Hearing Aid.

FREE home study course with instruments. No dealers.

CARVIN CO. Box 28 Baldwin Park, Calif. PS-12

LAW

STUDY AT HOME for Business Success and LARGER PERSONAL EARNINGS, 43 years expert instruction—over 114,000 students enrolled. LL.B. Degree awarded. All text material furnished. Easy payment plan. Send for FREE BOOK—"Law and Executive Guidance"—NOW!

AMERICAN EXTENSION SCHOOL OF LAW
Dept. PS-69, 664 N. Michigan Ave., Chicago 11, Illinois

EASE COLD MISERY

AT ALL DRUG STORES
45c and 75c SIZES

Take Tabcin

MILLIONS OF APPLIANCES NEED REPAIR!

EARN BIG MONEY.. WORK PART OR FULL TIME IN ELECTRIC APPLIANCE REPAIRING !

ELECTRIC REFRIGERATORS
WASHING MACHINES
VACUUM CLEANERS
ELECTRIC RANGES
MOTORS
SEWING MACHINES
TOASTERS
WAFFLE IRONS
MANGLES
HEATING PADS
FREEZERS
ELECTRIC FANS
ELECTRIC IRONS
LAMPS
ETC., ETC.

ELECTRONIC KIT TROUBLE DETECTOR
(Checks shorts, wattage, continuity, etc.)
is sent to all students

Learn this fascinating big money paying profession at home in your spare time. Learn by doing, by working with your hands building, testing, repairing electrical appliances of all kinds. Electrical appliance repairmen are needed everywhere—wherever electricity is used. You need no special previous training or experience. Age is no handicap. CHRISTY has trained over 33,000 men in all parts of the world. Men who today command big wages or own profitable businesses of their own.

PAY LATER FROM EARNINGS WHILE LEARNING

CHRISTY shows you how to make money while still learning, what to charge, how to set up your own shop, how to build power tools from spare parts, etc. It will pay you to write today.

MAIL COUPON for FREE BOOK

CHRISTY TRADE SCHOOL, Dept. D-3401
4432 N. Medzie Ave., Chicago 25, Ill.
Send me your FREE book on Electrical Appliance Repairing and special form for "paying later from earnings made while learning."

NAME.....AGE.....
ADDRESS.....
CITY.....STATE.....

MAKE BIG MONEY
Sharpening Lawn Mowers...
SPARE OR FULL TIME

Mr. C. E. Hardy of Missouri says, "I am doing a fine business with the Universal Grinder. One Customer sends another. I spent 40c for a newspaper ad and have done nearly $500 worth of business." G.E. of Ark. says, "I have had my Universal Grinder 2 months and made a net profit of $227."

ONLY ON THE UNIVERSAL LAWN MOWER GRINDER

. . . can the inside face and edge of the stationary blade, as well as the reel blades, be ground to proper clearance ALL IN ONE SET-UP, without removing any blade from either hand or power mower. **Send Today for Free Details.**
ROGERS MFG. CO. Dept. P-123 LINDSEY, OHIO

COLD ROOMS?
WESTAIR
HEAT BOOSTER
WILL SOLVE YOUR PROBLEM and CUT HIGH FUEL COSTS!

Automatically boosts heat to that hard to heat room, solves problems of gravity furnaces, operates inexpensively, adjustable to fit 7, 8, 9, 10, 12" pipe. Air cooled motor, patented blade, lifetime lubrication.

$14.95 LIMITED OFFER!

FURNACE BLOWER $26.95
Install in cold air return, quiet belt drive, long hour duty motor, thermo overload, self-aligning bearings, balance blower wheel, sight feed gauge, adjustable motor pulleys.
BLOWER COMPLETE with MOTOR and DRIVE $44.95

DEALER INQUIRIES INVITED

EDWARDS BROS. Established 20 Years
WESTAIR FAN & BLOWER CO. FREE CATALOG
5650 GRAND RIVER AVE., Dept. 6, DETROIT 8, MICH.

★ GET ON "UNCLE SAM'S" PAYROLL ★

START AS HIGH AS $3,795.00 A YEAR

MEN — WOMEN

PREPARE NOW FOR 1954 EXAMINATIONS

Mail Clerks and Carriers, Rural Carriers, Stenographer-Typists, Clerks, Messengers, and many others.

36-page book on Civil Service FREE

Mail Coupon TODAY
ACT NOW

FRANKLIN INSTITUTE (Not Government Controlled)
Dept. G-80, Rochester 4, N. Y.

Sirs: Rush to me, without charge, copy of 36-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

Name.....
Street.....
City.....Age?.....

No other book makes so many jobs so *Easy*

INCLUDING ELECTRICAL WORK—silencing floor squeaks—chimney repairs—plumbing—carpentry. . . . In fact, *Better Homes & Gardens* HANDYMAN'S BOOK shows you how to do 1600 jobs around your home.

INSTRUCTIONS ARE SO EASY that a beginner can follow them. And they're clarified even more by simple diagrams and photographs. Good results are assured!

GUARANTEED TO SAVE $ $ $

In plumbing bills! In carpenters' bills! In electricians' bills! We GUARANTEE the HANDYMAN'S BOOK will pay for itself within 6 months. Owners tell us we're too modest! On sale where books are sold, or order by mail. Only $3.95. (Canada $4.50.) Send coupon today.

BETTER HOMES & GARDENS,
409 Meredith Bldg., Des Moines 3, Iowa

Please send me the HANDYMAN'S BOOK. I enclose check ☐ OR ☐ money order for $3.95. (Canada $4.50.) If not entirely satisfied, I may return book in 10 days and my money will be refunded.

Name _____

Address _____

City _____ State _____

CASH IN ON
ROTO-SPLAY
ROTATING DISPLAY–TURNTABLE
OPERATES WITHOUT ELECTRICITY
• No Wiring • No Winding
• No Fire Hazard

"GOLDMINE FOR MEN WHO CALL ON MERCHANTS"

One of the fastest sellers ever to hit the U. S. So valuable Sears Roebuck bought for their own store use—so have Rexall, Woolworth, Eastman Kodak. And no wonder! ROTO-SPLAY is a **moving turntable** that can be put in windows, on counters or shelves. No springs to get out of order. No cords or plugs, so it can be put **anyplace** for displaying merchandise. Think of it—8 weeks of MOVING DISPLAY for the cost of two 10c flashlight batteries. Most small merchants want two or three—big stores buy quantities at our low price! You can make $10 to $15 and up on every such sale. A fast working salesman should sell 30 to 40 a day! Merchants know that **moving** displays sell merchandise. So your sales are **easy**. Get the facts quick. Write at once and make a "clean-up" while you can be first. Facts are FREE. Send your name and address today—sure!

only **$9.95**

Runs Night and Day for 5 to 8 Weeks on Two 10c Flashlight Batteries.

MAXILUME COMPANY
125 W. HUBBARD ST. DEPT. RS-912 CHICAGO 10, ILL.

DIRECT-CURRENT WELDER BUY
At AC-Transformer Welder Price!

REGULAR VALUE $350.00
BUY WHOLESALE $85.00 f.o.b.
Special Price Only

PAYS FOR ITSELF IMMEDIATELY! BRAND NEW! BELT DRIVEN! Ideal for field use where electricity isn't available. 1,001 uses on farm, in shop, factory! Powerful machine! Operates at 2800-3000 RPM off any convenient power source (tractor, etc.) **WELDS, CUTS, BRAZES:** steel; cast iron; bronze; aluminum; tool steels; stainless steels. **COMPARE FEATURES.** Welds straight or reverse polarity. Compact size. Special reactor-type series winding for **EVEN** arc. Rheostat for perfect pin-point heat control. Oversize ball bearings. 2-Groove V pulley. Output is 20 to 200 amps. (intermittent 250). Direct current makes arc striking and welding *easier!*
ACCESSORIES AT A BUY! Extra long 15-ft. welding and ground cables. Insulated ground clamp. 300 amp. electrode holder. Assorted electrodes. Dual-lens Helmet. Simplified instructions. COMPLETE OUTFIT (shipping wt. 95 lbs.) only $98.50 f.o.b.
FULL 1-YEAR GUARANTEE. You can't go wrong. Send for our
10-DAY FREE TRIAL OFFER
Use it for 10 days. Be 100% satisfied or money back.
FREE CATALOG of Welders, Motors, Electrical BUYS!
ROBERTS ELECTRIC CO., Dept. 110, 849 W. Grand, Chicago 22, Ill.

IT'S A "HIT!"

LOW PRICE OF $4.95

Order your revolutionary new "HIT" miniature camera today! Greatest value ever offered in a fine imported camera. Low price includes genuine pigskin carrying case, also roll of film.

Smaller than a matchbox! Precision made, easy to use. Additional films 30c per roll or six rolls for $1.50. Develops beautiful 2"x2" prints. Ten exposures per roll. Wonderful Christmas gift for young and old.

Shipped C.O.D. plus postage charges. Write today to Hit Sales, P. O. Box No. 524, Maywood, Illinois.

FREE FOR ASTHMA

If you suffer with attacks of Asthma and choke and gasp for breath, if restful sleep is difficult because of the struggle to breathe, don't fail to send at once to the Frontier Asthma Company for a FREE trial of the FRONTIER ASTHMA MEDICINE, a preparation for temporary symptomatic relief of paroxysms of Bronchial Asthma. No matter where you live or whether you have faith in any medicine under the sun, send today for this free trial. It will cost you nothing. FRONTIER ASTHMA CO., 142-W FRONTIER BLDG. 462 NIAGARA ST. BUFFALO 1, N. Y.

ILLUSTRATED CARTOON BOOKLETS!
SAY, FELLOWS! BE THE LIFE of the PARTY WITH THESE SMALL ILLUSTRATED CARTOON BOOKLETS of COMIC CHARACTERS
10, ALL DIFFERENT, $1 POSTPAID
SORRY, NO POSTAL C.O.D.'S!
REGINALD SALES
210-L Fifth Ave. New York 10, N. Y.

EARN $10 PER HOUR

GROWING **MIDGET TREES!**
AT HOME! · SPARE TIME! · NO EXPERIENCE NEEDED!

It's New! Amazing! FULL GROWN living dwarf trees — only 12 INCHES HIGH! Elm, orange, oak, cypress—any kind! All BLOOM and even BEAR FRUIT. Perfect, healthy specimens, but miniature! Make costly home decorations and beautiful expensive centerpieces (sold for over $1,500 each). It's easy! Fun! A new fascinating artistic HOBBY — a new fabulous $$$$$$ BUSINESS! Real seed and sensational new growing secret plan details. BOTH FREE!

FREE! GENUINE SEED AND PLAN

HOW TO LEARN GROWING SECRETS $ FREE SEEDS

NATIONAL NURSERY GARDENS, Dept. N12
8463 S. Van Ness, Inglewood 4, Calif.

Send for Your **FREE** Copy of the NEW 1954 MIDWEST TELEVISION and RADIO Catalog

MIDWEST *Presents*

For 1954 a Completely NEW LINE of

21" and 27" TELEVISION

CONSOLES
TABLE MODELS
and
COMPLETE CHASSIS
at
LOW FACTORY PRICES

YOUR CHOICE OF EITHER 12 CHANNEL VHF or All-Channel VHF-UHF Models

Buy your Television or Radio Direct from the Midwest Factory . . . on 30 DAYS TRIAL . . . Easy Terms . . . and at LOW FACTORY PRICES. For 34 years Midwest, the world's largest and oldest exclusive Factory-To-You radio and television manufacturer, has served hundreds of thousands of satisfied customers all over the world.

EASY TERMS
30 DAYS TRIAL

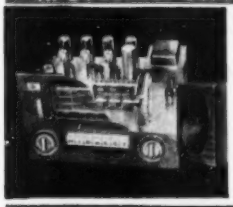
All models available in your choice of mahogany, walnut finish or blond limed oak.

FACTORY-TO-YOU

Also—Powerful New 1954 World-Ranging

MIDWEST Series 16 RADIOS

In Beautiful Consoles and Complete Chassis



Once again Midwest offers its famous series 16 five band AM-FM radio chassis and the magnificent new Symphony Grand Radio-Phonograph with 3-Speed Automatic Intermix Record Player. Also, a complete line of clock radios, table radios, and portables.

MIDWEST RADIO & TELEVISION CORP.
DEPT. E-24, 909 BROADWAY, CINCINNATI 2, OHIO

WRITE IN NAME AND ADDRESS (PLEASE PRINT) ON COUPON OR 2c POSTCARD

MIDWEST RADIO & TELEVISION CORP.
Dept. E-24, 909 BROADWAY • CINCINNATI 2, OHIO
Please send me your new FREE 1954 Catalog.

NAME _____
ADDRESS _____
CITY _____ ZONE ____ STATE _____

CUT-TO-FIT HOMES CUT BUILDING COSTS

CHOICE OF 57 DESIGNS

ORDER NOW

SAVE UP TO 1/3

Build your own home and save the builders' profit—plus savings in lumber and labor with Sterling Ready-Cut-Homes. Anyone can assemble with simple, easy to follow plans furnished. Every house complete with all lumber, roofing, nails, glass, hardware, paint, doors and windows marked ready to erect. Freight paid. Complete building plans ready for filing at low cost. Sold separately if desired. Write today!

PRICED FROM $2150 UP

Five Easy Payment Plans

Send 25c for NEW COLOR CATALOG

INTERNATIONAL MILL AND TIMBER CO.
DEPT. P.S. 123, BAY CITY, MICHIGAN

WRITTEN ALL TIME SERVICE GUARANTEE

17 JEWEL SHOCK RESIST NEW WATCH

DROP IT WET IT BANG IT

WAS $50.00
under O.P.A.
OUR PRICE ONLY

$14.95
plus $1.50 tax

YOU SAVE $35.00

Wear At Our Risk

Guaranteed Inca-Bloc, Shock-Protected Dampresist, Dust Resist construction. Anti-magnetic. Proved in Army, Air, and Navy service. Has sweep second hand, radium dial, genuine imported 17 jewel Swiss lever movement. You save sensationally on new de-luxe watches sold with WRITTEN ALL TIME SERVICE GUARANTEE, because we buy out distress and surplus stocks. Order now. Wear 10 days. Money back if not delighted. Order men's style—$14.95, plus $1.50 tax. Or ladies' style, $15.95 plus $1.60 tax. Send only $1 down payment with order, pay balance on arrival. Or enclose full payment plus tax, and we pay postage. Handsome expansion band included free if you order now. AIR MAIL XMAS DELIVERY GUARANTEED.

MEADE CO. Dept. 47, 175 FIFTH AVENUE NEW YORK 10, NEW YORK

TASOPE PHOTO-ENGRAVING PLANTS

MATERIAL COST OF THIS CUT 3½c SELLING PRICE $1.00 AND UP

Establish your own profitable PHOTO-ENGRAVING business. Make cuts for newspapers, printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for FREE catalog.

TASOPE DEPT. PS-12, AURORA, MO.

FREE CRAFT CATALOG

120 PAGES... Craft Supplies, Tools, Designs, Instruction Books from America's Largest, Most Complete Handcraft Stock.

Send for your free copy NOW!

GRIFFIN CRAFT SUPPLIES
5626-B Telegraph Ave. • Oakland 9, Calif.

ANALYZE HANDWRITING

MORE INCOME... MORE PRESTIGE AND MORE SUCCESS!

FASCINATING, uncrowded profession-business, full or spare time. Free illustrated lesson and yearbook shows how men and women in home and business find opportunity in analyzing handwriting. *Understand People—Make Money.* Free lesson and information about amazing opportunities if over 21.

I. G. A. S., Inc., 900 Wilhelt Building, Springfield, Missouri

MEN PAST 40

Men afflicted with Bladder Trouble, Getting Up Nights, Pains in Back, Hips, Legs, Nervousness, Dizziness, Physical Inability and General Impotency send for our amazing **FREE BOOK** that tells how you may correct these conditions and have new health and Zest in Life. Write today. No Obligation.

Excelsior Institute, Dept. B-5, Excelsior Springs, Mo.

DRILL SAW INTERNATIONAL REAM CUT

IDEAL AS A XMAS GIFT

DRILL, SAW, REAM . . . metal, pipe, wood, plastic, Transite, etc. Use with any electric drill, slow drill press, lathe or milling machine. Drills own starting hole—upper part of bit is used to cut, saw or ream circles, ovals, squares, or scrolls. Easy to operate. Ideal for carpenters, mechanics, electricians, plumbers, hobbyists, many others. Abrasive resistant, high speed steel. Flutes ground from solid. Will withstand severe continuous use without breaking. Resharpened at no charge. Takes place of up to $50 in tools. ¼" diameter, 2" cutting sections, total length 3½". Available in three types—All Purpose, Wood, Heavy Metal. Specify type needed. Set of 3, $11.50. Details on request. Shipped same day. Money-back guarantee. Dealer inquiries invited. ORDER NOW! SEND CASH, CHECK OR MONEY ORDER.

only $3.95 POST PAID

Manufactured and distributed by
INTERNATIONAL TWIST DRILL CORP.
618 Wyandotte, Rm. 690, Kansas City 5, Mo.

SAVE $65 ON THIS LUXURIOUS $100 CONTOUR CHAIR 34.95 FOR

Everything Needed Complete To Put It Together In One Evening

Scientifically correct design for restful, healthful, relaxing. Adjusts for perfect sitting or reclining comfort. Proved beneficial to heart, nerves . . . most popular chair in the home. Firestone foam rubber and washable, pliable genuine Duran upholstery. Would cost $100 or more in any store. Shipped all ready to put together in less than one evening by anyone who can use a screwdriver. No cutting, no drilling, no skill needed. A woman can do it. Order now! Everything needed for only $34.95, f.o.b. Balto. State color wanted: forest green, sapphire, blue, lipstick red, walnut brown. Enclose $5 deposit, pay balance on arrival. Money back guarantee. If not satisfied, return in 10 days. Make Money Selling and Assembling Contour Chairs for Friends.

Bestecraft, Dept. 51, Mathieson Bldg., Baltimore 2, Md.

MY GRADUATES ARE EARNING GOOD PAY!

"I'll always be grateful to your training which helped me get my present fine position as Assistant Parts Manager."
—Norman Weston

"Thanks to your training, I qualified for a good job as a Receiver Tester."
—Paul Frank Seier

"Your excellent instruction helped me get my present job as an airport radio mechanic."
—Eugene E. Basho

"I'm making good money in my own business, repairing and installing radio and TV sets — thanks to your training."—Irwin Polansky

YOU, TOO, CAN MAKE BIG PAY IN TELEVISION

NO EXPERIENCE NECESSARY

L. C. Lane, B.S., M.A.
President: Radio-Television Training Association
Executive Director: Pierce School of Radio & Television

ENOUGH EQUIPMENT TO SET UP YOUR HOME LABORATORY! As part of your training, I give you ALL the above equipment you need and more to prepare for a BETTER PAY TV job. You build and keep a professional GIANT SCREEN TV RECEIVER complete with big picture tube, takes any size up to 21-inch . . . also a Super-Het Radio Receiver, RF Signal Generator, Combination Voltmeter-Ammeter, Ohmmeter, C-W Telephone Transmitter, Public Address System, AC-DC Power Supply. Everything supplied including all tubes!

MORE MONEY AND A CAREER ARE WAITING FOR YOU HERE!

EXPERT FM-TV TECHNICIAN TRAINING! SAVE VALUABLE TIME! My FM-TV Technician Course can save you months of training if you have previous Armed Forces or civilian radio experience! Train at home with kits of parts, plus equipment to build BIG SCREEN TV RECEIVER, and FREE FCC Coaching Course! ALL FURNISHED AT NO EXTRA COST!

FREE FCC COACHING COURSE! Important for BETTER PAY JOBS requiring FCC License. You get this training AT HOME and AT NO EXTRA COST Top TV jobs go to FCC licensed technicians.

GOOD SPARE TIME EARNINGS! Almost from the very start you can earn extra money while learning, repairing Radio-TV sets for friends and neighbors. Many of my students earn up to $25 a week . . . pay their entire training from spare time earnings . . . start their own profitable service business. *Act now!*

OPTIONAL: TWO WEEKS TRAINING IN NEW YORK CITY AT NO EXTRA COST! You get two weeks, 50 hours, of intensive Laboratory work on modern electronic equipment at our associated school in New York City —Pierce School of Radio and Television. And I give you all this AT NO EXTRA COST whatsoever, after you finish your home study training in the Radio-FM-TV Technician course and FM-TV Technician Course.

CIVILIANS! VETERANS! PREPARE FOR A BRIGHTER FUTURE AS A TRAINED TV TECHNICIAN! Thousands of new jobs in TV are opening up in every state as new stations go on the air. You too can take your place in America's booming TELEVISION and Electronics industries . . . enjoy the success and happiness you always wanted. Keep your present job while I prepare you at home for a life-time career as a trained TV Technician. You "learn-by-doing" with the actual parts and equipment I send you . . . the same successful methods that have helped hundreds of men—*many with no more than grammar school training*—master television!

LEARN ALL ABOUT COLOR TV. I give you the latest principles and practical training in TV COLOR!

NEW! PRACTICAL TV CAMERAMAN & STUDIO COURSE! (For men with previous radio and TV training) I train you at home for a big pay job as the man behind the TV camera. Work with TV stars in TV studios or "on location" at remote pick-ups! A special one-week course of practical work on TV studio equipment at Pierce School of Radio & TV, our associate resident school in New York City, is offered upon your graduation.

MAIL COUPON FOR 4 FREE AIDS!
NO OBLIGATION WHATSOEVER!

NO SALESMAN WILL CALL!

VETERANS!

My schools fully approved to train veterans under new G.I. Bill! If discharged after June 27, 1950 — CHECK COUPON! Also approved for RESIDENT TRAINING in New York City at Pierce School of Radio and Television . . . qualifies you for full subsistence allowance up to $160 per month. Write for details.

RADIO-TELEVISION TRAINING ASSOCIATION
52 EAST 19th STREET, NEW YORK 3, N. Y.
Licensed by the State of New York Approved by the VA

Dept. P-12A

Mr. Leonard C. Lane, President
RADIO-TELEVISION TRAINING ASSOCIATION
52 East 19th Street, New York 3, N. Y.

Dear Mr. Lane: Mail me your NEW FREE BOOK, FREE SAMPLE LESSON, and FREE aids that will show me how I can make BIG MONEY IN TELEVISION. I understand I am under no obligation and no salesman will call.

(PLEASE PRINT PLAINLY)

NAME _____ AGE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

I AM INTERESTED IN:

☐ Radio-FM-TV Technician Course
☐ FM-TV Technician Course
☐ TV Cameraman & Studio Course

VETERANS! Check here for Training under NEW G.I. Bill ☐

Imagine! Owning Your Own RANCH HOUSE, CABIN or HIDEAWAY

by the Shore or in the Mountains

Only $2.49
7 Days' FREE Trial!

Sturdy snow-cabin perfect for one- and two-family living.

You can build roomy wide-porched hideaway of saving of two-thirds or more!

Only 1 of 19 fine floor plans!

Simple cabin with kitchenette makes ideal summer home.

Complete plans for typical hunting-fishing lodge.

Amazing NEW Book Shows You How You Can Build Any of 27 Different Structures . . . . . for Mere Cost of Materials!

256 Pages, 207 Pictures, 23 Chapters!

"*How to Build Cabins and Ranch Houses*" will *slash* the cost of your new home! This one great book shows how you can build it yourself at *lowest possible cost* from the foundation to the roof. And it's EASY! Just choose your favorite from the loads of illustrations (complete with floor plans) whether it be cabin, lake cottage, modern ranch house, or mountain retreat. With the aid of this brand-new, money-saving book, you'll complete your house in *record time!*

SIMPLIFIED DETAILS

You don't need professional help when you start building your dream home. Here are simplified, detailed instructions on laying a foundation, building and caulking walls, constructing stairs, laying floor boards, estimating costs. Step-by-step plans on making windows, building fireplaces and chimneys, cutting doors, installing plumbing and lighting. You'll also find out how to beautify your cabin or ranch house, prevent wood decay, build rustic furniture, and speed up the building with many short cuts. Equip your house with all modern conveniences at a fraction of the usual cost!

SEND NO MONEY NOW!

Detach and mail coupon below, then pay postman the low, *bargain* price of $2.49, plus a few cents postage, when your book arrives. Examine this wonder-book with its 256 pages, 207 illustrations, and sturdy cloth binding for a *full week!* Then, if you don't agree that you'd pay twice as much ordinarily for such a big, jam-packed book, simply return it for refund with NO OBLIGATION! But, HURRY—get your copy while they last!

EXTRA!

Make *big* money by building for PROFIT! Valuable section shows you how to *build and sell* roadside stands, gas stations, colorful signboards and more! No complicated, expensive tools needed. This one section *alone* makes this the "Big Opportunity" book of your lifetime!

MAIL ORDER FORM TODAY!

Popular Science Pub. Co., Dept. 1253
353 Fourth Avenue, N. Y. 10, N. Y.

Please send my trial copy of *"How to Build Cabins and Ranch Houses"* today. I'll pay postman $2.49 (plus postage) on delivery. If not delighted, I may return book within 7 days for full refund.

Name .....

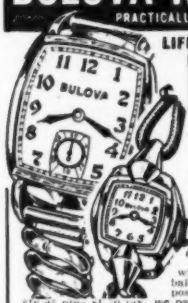
Address .....

City ..... Zone ..... State .....

☐ *Check here if you remit now. We pay postage. Same refund guarantee.*

Famous 15 and 17 Jewel BULOVA WATCHES $16.95 PLUS TAX

PRACTICALLY WHOLESALE TO YOU



LIFETIME SERVICE GUARANTEE

WHY PAY $59.50 SAVE $42.55

Also Choice Of
- DENRUS
- GRUEN
- ELGIN or
- WALTHAM WATCHES

You get these unredeemed SERVICE guaranteed Bulova and other movement in latest style Yellow Gold Cases at this sensationally low price because we bought out huge surplus stocks of leading New York and Md. jewelers. Order now while they last. Specify make preferred and whether men's or ladies'! Only $16.95 plus $1.70 tax.

Free Trial Offer! Wear At Our Risk!

Money back guarantee in 10 days if not delighted!

SEND ONLY $1 with order. Pay balance C.O.D. plus postage. Or enclose $16.95 plus $1.70 tax, we pay postage. Handsome Expansion Band with orders at no extra cost. Air Mail Xmas Delivery Guaranteed.

LIFETIME SERVICE GUARANTEED 17 Jewel Swiss WRIST WATCH

Worn by Army, Navy & Marines. Thousands sold for $55 under O.P.A.

$14.95 Plus $1.50 tax

New Incablock, Shock-Protected Water & Dust Tight

Maryland Distributors, Dept. 557

501 E. Baltimore St., Baltimore 2, Md.

Write for Free Watch and Diamond Ring Catalog—Practically Wholesale Prices.

STUDY AT HOME

WITH AN EDUCATIONAL INSTITUTION

Courses in ARTS AND SCIENCES: Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Geology; Pol. Science; Theology; Law; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture. **ENGINEERING:** Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Diesel, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Refrigeration, Chemical. Send for free catalog.

McKinley-Roosevelt Incorporated, 4610-A3, Sheridan Rd., Chicago 40, Illinois

ILLUSTRATED COMIC BOOKLETS

THE KIND MEN LIKE!

THE GIRLS LIKE IT TOO ! !

(VEST POCKET SIZE)

They are loaded with rare cartoons. Full of Fun and Humor. ***20 DIFFERENT*** booklets sent for $1 in plain wrapper. No C.O.D.

BULCO, Dept. 791 P.O. Box 89-K., Bklyn.29, N.Y.

Broken or Loose FALSE PLATE?

Fix it Yourself EASILY in a Few Minutes

Your plates may become broken or loose just when you need them most. With FIX-IT-KIT you can repair your own broken plates. Also tightens loose fitting plates, easily. Get permanent comfort with professional material. Complete instructions. Satisfaction guaranteed or your money refunded. *Order Now* at a new low price only **$2.98** postpaid — or sent C.O.D

Make Plates Like New

DENT-FIX DENTAL PRODUCTS, Dept. PS-12

P.O. Box 674 Kansas City 8, Missouri

Authenticast MINIATURE MODELS

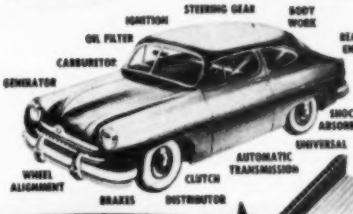
Miniature replicas accurately scaled and cast in metal from gov't blueprints. Shown are the three latest additions to the American line. Every important foreign tank is also duplicated in this bantam size, with every minute detail distinctly depicted. Authenticast models are famous the world over—always recognized for their life-like appearance. Scale: 1" to 108". See these and complete assortment of Ships, Planes and Railroad equipment in this big, new Authenticast catalogue—Vol. IV. Send 35¢ for your copy today.

Send for big, new, Vol. IV Authenticast catalogue—35¢

COMET METAL PRODUCTS CO., INC. RICHMOND HILL 18, N. Y

HOW TO FIX ANY PART OF ANY CAR

QUICKLY--EASILY--RIGHT!



FREE 7-DAY TRIAL

WHETHER you're a beginner or an expert mechanic — now you can "breeze through" any "fix-it" job from simple carburetor adjustment to complete overhaul. Just look up job in index of MOTOR'S Brand-New 1953 Auto Repair Manual. Follow simple step-by-step directions, clear pictures. Presto—the job is done!

No guesswork! MOTOR'S MANUAL takes you from "scratch" — shows WHERE to start, WHAT tools to use Covers EVERY job on EVERY car built *from 1935 thru 1953!*

Everything You Need to Know "Boiled Down" from 189 Official Shop Manuals

NEW, REVISED, ENLARGED, 1953 Edition contains the "meat" from over 189 OFFICIAL shop manuals — simplified for YOU. 37,000 essential repair specifications on 872 car models. Over 850 big pages. More than 2500 "this-is-how" pictures. 227,000 service and repair facts. Leads beginners every step of the way. Time-saving factory repair procedures for experts. Instructions and pictures so clear you CAN'T go wrong. Used by U. S. Army and Navy.

Try Book FREE 7 Days

SEND NO MONEY! Pay postman nothing. Make Manual show you what it's got. Unless you agree this is the greatest time and work saver you've ever seen—return book in 7 days and pay nothing. Mail coupon today to: MOTOR — Book Dept., Desk 212, 250 W. 55th St., New York 19, N. Y.

Covers 872 Models All These Makes

Buick	La Salle
Cadillac	Lincoln
Chevrolet	Mercury
Chrysler	Nash
Crosley	Nash
De Soto	Rambler
Dodge	Oldsmobile
Ford	Packard
Frazer	Plymouth
Henry J	Pontiac
Hudson	Studebaker
Kaiser	Terraplane
Lafayette	Willys

Same FREE Offer On MOTOR's Truck and Tractor Manual

Covers EVERY job on EVERY popular make gasoline truck, tractor made from 1939 thru 1953. FREE 7-Day Trial. Check proper box in coupon.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MOTOR BOOK DEPT.
Desk 212, 250 W. 55th St., New York 19, N. Y.
Rush to me at once (check box opposite book you want):

☐ **MOTOR's** *New* **AUTO REPAIR MANUAL.** If O.K., I will remit $1 in 7 days, $2 monthly for 2 months and a final payment of 95c (plus 35c delivery charges) one month after that. Otherwise I will return the book postpaid in 7 days. *(Foreign price, remit $5 cash with order.)*

☐ **MOTOR's** *New* **TRUCK & TRACTOR REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. *(Foreign price, remit $10 cash with order.)*

Print Name..... Age.....

Address .....

City..... State.....

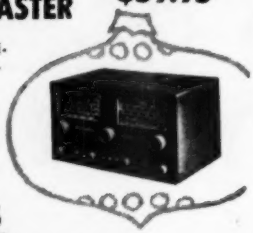
☐ **Check box and save 35c delivery charge** by enclosing WITH coupon entire payment of $5.95 for Auto Repair Manual (or $8 for Truck & Tractor Repair Manual.) Same return-refund privilege.

Give the WORLD

the MIGHTY MIDGET

SW-54
The whole world of radio — from 540 kcs. to 30 mcs. in 4 bands — is yours to enjoy with this sleek, low-priced beauty! Hear foreign stations, including Radio Moscow, ships, amateurs, aircraft, police! Receives voice or code. All this plus the standard broadcast band — your favorite programs with new power and clarity. **$59.95**

the WORLD MASTER



NC-88
A truly professional communication receiver in every way. the World Master includes circuit refinements and features usually found only in receivers costing substantially more! It's the ideal choice for shortwave listeners, novices and experienced amateurs! Covers 540 kcs. to 40 mcs. in 4 bands. **$129.95**

National BROADCAST and SHORTWAVE RECEIVERS
Makers of U. S. Navy Receivers
MALDEN, MASS.

WINTER OR SUMMER
DO EVERY OUTDOOR JOB FASTER—EASIER—BETTER

WITH A GEORGE GARDEN TRACTOR

$119.50 F.O.B. Sullivan, Ill.

Illustrated:
2 wheel, 2 HP GEORGE Garden Tractor, Briggs or Clinton Engine

Your George garden tractor is a multi-purpose, year-round work saver. In price, it compares with a power mower. In use, the George garden tractor is incomparable. Complete range of attachments for tilling gardens... mowing lawns ... cutting weeds ... removing snow. A George tractor is ideal for every purse and purpose.

SEND TODAY
Write for free copy of illustrated George garden tool folder. See how a George garden tractor can do every outdoor chore.
George Garden Tool Div.
Box PS-12
Sullivan, Illinois

GEORGE GARDEN TOOL
Div. of Community Industries Ass'n

MAKE **CRIME** YOUR BUSINESS

ON THE SIDE OF THE LAW!

Help fight crime! . . . Earn steady good pay as a Finger Print Expert or Investigator. I.A.S. trains you—by easy, low-cost home study lessons. Learn this exciting work in spare time. Write for full details now!

OVER 800 POLICE BUREAUS...

Employ I.A.S.-trained men . . . proof of what I.A.S. can do. Write today (state age) for details. No obligation. No salesmen will call.

INSTITUTE OF APPLIED SCIENCE
(A Correspondence School Since 1916)
1920 Sunnyside Ave., Dept. 1369 Chicago 40, Illinois

LEARN MODERN WATCH AND CLOCK REPAIRING

Complete Course—Only $5.95

At home, spare time. Good field now . . . security and contentment in future. Start part-time business and **EARN while you learn.** Horology is precision instrument work...a great and growing field, sensational opportunities. Easy self-instruction course. Full price, only $5.95. SEND NO MONEY. Just pay postman, plus C.O.D. postage. Or send $5.95 with order, we'll ship postpaid. Satisfaction guaranteed or refund. **NELSON-HALL CO., 210 S. Clinton St., Dept. 2MX-1, Chicago 6, Ill.**

AUTOMATIC BOOSTER COOLER

Fuel Economizer & Decarbonizer. Burns water, saves gas, increases cooling. Filters cooling system, cleans carbon and gives more speed & power. Fits any car or truck. No mechanic needed to install.

A. B. C. RADIATOR CO.
401 S. CENTRAL AVE Balto., 2, Md.

Build your own *JET ENGINE!*

Order these plans today

1. JET PROPELLED BICYCLE. Assemble your own. Photo and instructions $1.00.
2. HOW TO MAKE EXPERIMENTAL JET ENGINES. Seven sheets drawings with information and instructions $2.95.
3. BOTH OF ABOVE in one order $3.75.

SEND NO MONEY. Order both at once $4.75 C.O.D. in USA plus c.o.d. postage. Send check or Money Order and we pay postage. Get other information too. Rush Order.

J. HOUSTON MAUPIN, Dept. 66, Tipp City, Ohio

NO TANKS USED NEW SIMPLIFIED METHOD
SUCCESS IN THE ELECTROPLATING BUSINESS

ELECTROPLATE

ANY OBJECT IN HOME, SHOP, GARAGE OR START YOUR OWN WELL PAYING ELECTROPLATING BUSINESS

TOOLS SOFTWARE HOUSEHOLD ARTICLES JEWELRY BABY SHOES AUTO PARTS & MANY ARTICLES

NOW, using **NEW** plating kit, it's easy to electroplate any object. Complete kit and instructions on plating metal and non-metal objects, with nickel, copper, chrome, gold, etc., plus full data on obtaining all the business you desire and make **BIG MONEY** full or spare time. **ONLY** $5.95. **SEND NO MONEY**—everything sent **C.O.D.** plus postage—OR send $5.95 now and receive it postpaid. Money back in 7 days if not satisfied.
M. Z. NATIONAL SALES CO., 113-T West 42 St., N. Y. 36, N. Y.

SEE HOW EASY IT IS Step by Step!

Be an Artist! Draw & Paint for Money (and fun!)

Prepare at home to become a well-paid professional artist —or a well-trained hobbyist. Our 39th year—thousands of successful graduates. Write for Talent Test and illustrated booklet. "Art for Pleasure & Profit." Both FREE. No salesmen will call.

Studio 1312K, WASHINGTON SCHOOL OF ART
WASHINGTON 5, D.C.

New! 2 in 1 Combination!
Pocket-Size
50 POWER MICROSCOPE
and 10 POWER TELESCOPE
Only 4.50 ppd.

Useful Telescope and Microscope combined in one amazing, precision instrument. Imported! No larger than a fountain pen. Telescope is 10 Power. Microscope magnifies 50 Times. Sharp focus at any range. Handy for sports, looking at rare objects, just plain snooping. Wonderful Xmas gift. Send check or M.O. Satisfaction Guaranteed!
Order Stock #30,059-N ..... $4.50 ppd.

GET FREE CATALOG #N—World's largest variety of Optical items. Bargains galore . . . War Surplus—Imported—Domestic! Microscopes, Telescopes, Hand Spectroscopes, Prisms, Lenses, Reticles, Mirrors and dozens of other hard-to-get Optical items. Ask for FREE CATALOG #N.

EDMUND SCIENTIFIC CORP., Barrington, N. J.

2 OR 4 WHEEL DRIVE FOR JEEPS IN SECONDS

AMAZING NEW WARN HUB
gives your 4-wheel drive Willys 2-wheel pep, power, speed, extra mileage, passenger car performance—as well as 4-wheel power and traction! Change from 2-wheel to 4-wheel or back in seconds by turning finger-tip control on hubs. Warn hubs reduce wear on front axle assembly and front tires, eliminate shimmy, increase gas mileage up to 6 miles per gal. Unconditional Money Back Guarantee. $65.00 pair prepaid. ALSO AVAILABLE: Warn Standard Hub for Willys $20.00 pr., Dodge $23.00 pr. and Warn Automatic Hub for Willys $120.00 pr. At Dealers or direct.

WARN MFG. CO.
RIVERTON Box 6064-B3 Seattle 88, Wash.

STOPS FOGGY WINDSHIELDS
NEW Chemical Mitt

Amazing Discovery! Autoists wild over new FOG-STOP Windshield Cleaner. Simply glide over windshield chemically-treated Mitt—at once glass sparkles crystal clear. Blurry mist, frost, sleet, snow disappear like magic. Stops fogging. *Sells like wild!*

SAMPLES FOR AGENTS Sample offer sent immediately to all who send name at once. Hurry. Postcard will do. SEND NO MONEY—just your name. KRISTEE CO., Dept. 715, AKRON, 8, OHIO

BE YOUR OWN BOSS!!!

Make big money! Get ahead in something for yourself! Be a floor surfacing contractor and sand both new and old floors. No experience needed. High earnings, steady work with a future! Write for booklet "Opportunities in Floor Surfacing," enclosing 25 cents to cover cost or stamps to cover handling.

AMERICAN
FLOOR SURFACING MACHINE CO.
132 So. St. Clair Street • Toledo 3, Ohio

Now—figure studies that are *naturally* beautiful! See Hollywood's most gorgeous, curvaceous artists' models—in breath-taking 3-D depth and beauty. Amazingly realistic! Photos actually "come to life" when viewed through Magic 3-D Viewer! They're new—different—sensational!

Send only 25¢ for large Sample Photos & Magic Viewer (worth much more)
or $1 for COMPLETE photo assortment & viewer

Hollywood SALES CO.
3414 W. Magnolia Blvd., Burbank 25, Calif.

BECOME AN
Electrical Engineer

- **Major in Power or Electronics**
- **Earn B. S. Degree in 36 months**

Over 50% of the nation's industrial leaders began their careers with engineering training. Today, the demand for young, trained Electrical Engineers and Technicians is constantly expanding. Eight separate programs give you a wide range of career opportunities.

Plan Your Career From these Courses in Electrical Technology

ENGINEERING COURSES
Electrical Engineering — Bachelor of Science Degree
Save a valuable year through optional year 'round study.
Electronics major ..... 36 months
Power major ..... 36 months
TECHNICIAN COURSES
Electro Technician ..... 12 months
Electronics Technician ..... 12 months
Radio Technician ..... 12 months
Radio and Television Technician ..... 18 months
SERVICE COURSES
Electrical Service ..... 6 months
Radio and Television Service ..... 12 months

Terms open January, March, June, October

Approved for veterans. Prior Military, Practical or Academic training evaluated for advanced credit. Faculty of specialists. 50,000 former students. Annual enrollment fom 48 states and 23 overseas countries. 50th year. Non-profit.

MECHANICAL TECHNOLOGY COURSES — Also available, Service Technician courses 6 to 18 months — Heating, Refrigeration, Welding, Air Conditioning and Mechanical — Mechanical Engineering with a major in Design, Metal Fabrication or Plant Engineering.

Also, general 3-month preparatory course.

Residence courses only. Send Coupon for facts.

MILWAUKEE SCHOOL OF ENGINEERING

MILWAUKEE SCHOOL OF ENGINEERING
Dept. PS-1253, 1025 N. Milwaukee
Milwaukee 1, Wisconsin
Send: "Your Career" Booklet

I am interested in .....
name of course
Name ..... Age .....
Address .....
City ..... Zone ..... State .....
If veteran, indicate date of discharge .....

WHEREVER YOU GO

TAKE ALONG THE

Johnson Reel

USE IT ON ANY ROD OF YOUR CHOICE FOR TROUBLE FREE SPINNING CASTING OR FLY FISHING

For you men who know mechanical perfection when you see it. From the moment you make your first cast - you're in for a treat. Beginner or expert, you'll find the NEW Johnson 80 the *one, all purpose* reel. "Nylatron" Drag for smooth action . . . "Change-Easy" Spools for quick line changes . . . true spinning action eliminates line twist.

FREE . . write for folder on Johnson Reels, Model 80, 60, 40a, 20 - all price ranges.

DENISON-JOHNSON SALES CORP., MANKATO 5, MINN.

STUDY AT HOME LAW FREE BOOK!

Prepare for the Bar!

Write today for a copy of our FREE book, **"The Law-Trained Man,"** which gives the bar rules in your state and tells how ambitious men and women since 1890 have been preparing at home in spare time for the practice of law by studying the famous Blackstone bar-training course. All needed instruction material is furnished including big 16-volume law library. Law diploma awarded. Moderate tuition; easy monthly terms. Write for FREE book today!

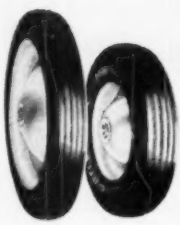
BLACKSTONE SCHOOL OF LAW
225 N. Michigan Ave., Dept. 129 Chicago 1, Illinois

Mortite KEEPS COLD OUT SAVES FUEL

It's the perfect weatherstripping. Cordlike and pliable, Mortite goes on in a jiffy, without tools or tacks. Anyone—even Junior—can press it in place around windows, doors, transoms, baseboards. Comes off easily in spring. Hundreds of other plugger-upper uses the year around. 3 packages—29c contains enough for 1 window; 98c for 4. $1.25 for 5 or 6 windows. *Higher west of Rockies and Canada.* Get Mortite at stores or write for circular.

J. W. MORTELL CO.
534 Burch St., Kankakee, Ill.

Ball-Bearing *SPEED WHEELS*



JUVENILE WHEELS (No bearing, solid tires)
5" . . . . . .45c 6" 65c
7" 75c

(Semi-pneumatic tire, ball bearing)

8x1.25	$1.85	10x1.25	$2.20
8x1.75	1.95	10x1.75	2.30
8x2	2.20	10x2.00	2.65
12x1.75	3.45		

INDUSTRIAL WHEELS
Lug Base, Semi-Pneumatic tire

6x2 SW	$3.45	10x2.00	$6.10
6x2.00	4.00	10x2.75	5.15
8x2.00	5.20	12x2.00	6.90
8x2.50	5.40	12x3.00	9.20
16x4.00	15.15		

Smooth Base, Pneumatic tire and tube

8x3.00	$11.00	12x4.00	$12.10
10x2.75	6.80	4.00x8	13.10
10x3.50	10.55	14x4.50	13.40

Available Now — CASTERS
Write for circulars on all wheels.
No c.o.d. orders. Prices F.O.B. our plant.

JIM BROWN TOY COMPANY
1095 HOME AVENUE PS-1053 AKRON 10, OHIO

MAKE IT YOURSELF!

It's easy. Kit includes all wood parts cut to shape. Material for metallic finish included. All you need is a penknife. Nine authentic full scale models from which to choose.

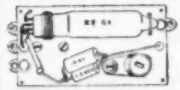
$3.50

"COLT .44 FRONTIER"

Send 10c in Coin for NEW Illustrated Folder to:

O'BRIEN GUNCRAFT, P. O. Box 657, Madison, Wis.

RADIO CONTROL YOUR MODELS



"DELUXE MIDGET 1" RADIO CONTROL, CONSISTS OF LICENSE FREE BAND TRANSMITTING RADIO, A RECEIVING RADIO & A CONTROLLING ESCAPEMENT LONG RANGE TO OPERATE MODEL AIRCRAFT, BOAT & AUTO MODELS. ALL THREE UNITS ABOVE SIMPLE ASSEMBLY WITH OUR PARTS & PLANS $9.98
DETAILED INFORMATION & RADIO CATALOG 25c
SPECIAL "SUPPLY DIRECTORY" & SUPPLY COUPON (coupon value $7.00) ONLY $1.00

"DELUXE MIDGET 1" RADIO CONTROL $9.98

RADIOMODELS, BOX 36, DEPT. P
BALTIMORE 6, MARYLAND

6 GREAT SHAW DU-ALL

Plow
Plant
Cultivate
Mow
Rake
Cut Trees
Saw Wood

Walking or Riding Tractors
1½, 3, 5 H.P. walking models. 2½ to 12H.P. riding tractors. Get just the power you need in Shaw extra strength superior traction machines. All wanted tools, attachments. Dependable for nearly 50 years. See a Shaw dealer. Write for **FREE literature**, low prices—today.

SHAW Mfg. Co. 5712 Front St., Galesburg, Ks.
668-PS N. 4th St., Columbus, O.

RAISE GIANT FROGS BIG DEMAND

Nutond Giants

MILLIONS USED YEARLY!

Good prices year around! Breeder lays up to 20,000 eggs yearly. Nation-wide markets waiting for all you can ship. Men & Women **get ready now** for next spawn. Small pond starts you. New book tells how! Send for my illustrated **FREE** folder today. Do it now!

ALBERT BROEL-11
P. O. Box 506 New Orleans 12, La.

NEW FALSE PLATE

FROM YOUR OLD ONE IN 18 HOURS

AS LOW AS $14.95

Send us your old broken, cracked or loose plates and we'll transform them into new lightweight wonder plastic plates. NO IMPRESSIONS needed with our revolutionary method. We use your own old plates. We remake them completely in only 18 hours. Missing teeth carefully matched and replaced. We GUARANTEE TO SATISFY YOU OR REFUND YOUR MONEY.

SEND NO MONEY—Send us your name today and we'll RUSH COMPLETE DETAILS. Begin to enjoy life right now. Clip this Ad; save it and send for free facts.

CHICAGO DENTAL PLATE LABORATORY • Dept. PS-12
30 N. Dearborn St. • Suite 807 • Chicago 2, Ill.

LEARN

DRAFTING

IT'S EASY IN SPARE TIME AT HOME!

Now YOU can get in on the unlimited opportunities and big pay open to skilled draftsmen. You take no risk! Cleveland Engineering Institute will train you quickly to fill industrys' growing, desperate need. You will be privately tutored by a licensed professional engineer. C.E.I. *guarantees* to train you until you qualify. Thousands have succeeded with a C.E.I. diploma. So can YOU! Two courses to choose from: Mechanical or Aeronautical. Get full information at once! No obligation. No salesman will call. Just write your name and address on a 2c postcard and mail it today!

FREE SUCCESS BOOK

CLEVELAND ENGINEERING INSTITUTE
Extension Division PS 12C
6300 Euclid Ave., Cleveland 3, Ohio

TELEPHONES

Desk Stand style

Slightly used and in excellent condition.

Many Valuable Uses—

Inter-house phones
Loud Speakers
Microphones
Educational purposes
Toys, etc.

$1.95

Postpaid in U.S.A.

Come complete, ready to use
Wiring Diagrams Furnished
Please add 75c each shipping and handling costs.

MICROPHONE Dept. X-504
1760 W. Lunt Ave., Chicago 26, Ill.

HE-MAN VOICE!

STRENGTHEN *your* voice this tested *scientific* way. Yes—you may now be able to improve the POWER of your speaking and singing voice . . . . in the privacy of your own room! Self-training lessons, mostly silent. No music required.

FREE BOOK Write TODAY for Eugene Feuchtinger's great booklet "How to Develop a Successful Voice." It's absolutely FREE! You must state your age. Booklet mailed postpaid in plain wrapper. No salesman will call. Send your name and age RIGHT NOW!

PREFECT VOICE INSTITUTE
210 S. Clinton St. Studio MX-1 Chicago 6, Ill.

LEARN LOCKSMITHING

Learn this fascinating, profitable trade from experts in your spare time at home!

Age or physical handicap no disadvantage. Year around steady income. Full or part time. Practical, illustrated lessons. You can make money even while learning! All materials and special tools supplied without extra charge.

LOCKSMITHING INSTITUTE, Dept. PS-48
15 PARK AVENUE RUTHERFORD, N. J.
Lic. by N.J. State Board of Education
Approved for Veterans

KIDNEYS MUST REMOVE EXCESS WASTE

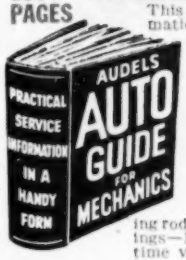
Nagging backache, loss of pep and energy, headaches and dizziness may be due to slowdown of kidney function. Doctors say good kidney function is very important to good health. When some everyday condition, such as stress and strain, causes this important function to slow down, many folks suffer nagging backache—feel miserable. Minor bladder irritations due to cold or wrong diet may cause getting up nights or frequent passages.

Don't neglect your kidneys if these conditions bother you. Try Doan's Pills—a mild diuretic. Used successfully by millions for over 50 years. It's amazing how many times Doan's give happy relief from these discomforts—help the 15 miles of kidney tubes and filters flush out waste. Get Doan's Pills today!

WHAT ALL

AUTO MECHANICS WANT TO KNOW

1664 PAGES



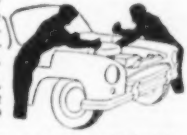
This Big Practical Book gives full information with working diagrams covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.

Diesel Engines, Hydramatic & Fluid Drives Fully Explained.

A complete Guide of 1800 pages, with over 1500 illustrations showing inside views of working parts, with instructions for service jobs.

IT PAYS TO KNOW

How to fit pistons—How to locate engine knocks, How to fit connecting rod bearings—How to service main bearings—How to recondition valves—How to time valves—How to adjust fan belts—How to adjust carburetors and chokes, How to rebuild a clutch—How to service automatic transmissions—How to service brakes—How to adjust steering gear—How to cope with ignition troubles—How to service distributors—How to time ignition—How to "tune up" an engine.



$4 COMPLETE • PAY $1 A MO.
TO GET THIS ASSISTANCE FOR YOURSELF SIMPLY FILL IN AND MAIL COUPON TODAY.

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a Handy Form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION. Send No Money. Nothing to pay postman.

MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me postpaid for FREE EXAMINATION books marked ☒ below. If I decide to keep them I agree to mail $1 in 7 Days on each book or set ordered and further mail $1 monthly on each book or set until I have paid price, otherwise I will return them.

Check NOW!

You Can Look Over Any Guide In Your Own Home

—

Start the Easy Payments If Satisfied

MAIL THIS TODAY

- ☐ AUTOMOBILE MECHANICS GUIDE, 1800 Pages $4
- ☐ TRUCK & TRACTOR GUIDE, 1299 Pages . . . 4
- ☐ DIESEL ENGINE MANUAL, 575 Pages 2
- ☐ MACHINISTS HANDY BOOK, 1650 Pages . . . 4
- ☐ WELDERS GUIDE, 400 Pages 1
- ☐ BLUE PRINT READING, 416 Pages 2
- ☐ MATHEMATICS & CALCULATIONS, 700 Pages . 2
- ☐ SHEET METAL PATTERN LAYOUTS, 1100 Pages 4
- ☐ SHEET METAL WORKERS HANDY BOOK, 388 Pgs. 1
- ☐ MECHANICAL DRAWING GUIDE, 160 Pages . . 1
- ☐ MECHANICAL DRAWING & DESIGN, 480 Pages 2
- ☐ AIRCRAFT WORKER, 240 Pages 1
- ☐ TELEVISION SERVICE MANUAL, 384 Pages . . 2
- ☐ RADIOMANS GUIDE, 914 Pages 4
- ☐ ELECTRONIC DEVICES, 216 Pages 2
- ☐ ELECTRIC MOTOR GUIDE, 1000 Pages 4
- ☐ ELECTRIC WIRING DIAGRAMS, 272 Pages . . 1
- ☐ ELECTRICIANS EXAMINATIONS, 250 Pages . . 1
- ☐ ELECTRIC POWER CALCULATIONS, 425 Pages . 2
- ☐ HANDY BOOK OF ELECTRICITY, 1440 Pages . . 4
- ☐ ELECTRIC DICTIONARY, 9000 Terms 2
- ☐ ELECTRIC LIBRARY, 7000 Pages (12 Book Set) 18
- ☐ MARINE ENGINEERS HANDY BOOK, 1258 Pgs. 4
- ☐ SHIPFITTERS HANDY BOOK, 250 Pages . . . 1
- ☐ REFRIGERATION & Air Conditioning, 1280 Pgs. 4
- ☐ MILLWRIGHTS & MECHANICS GUIDE, 1200 Pgs. 4
- ☐ POWER PLANT ENGINEERS GUIDE, 1500 Pages 4
- ☐ ENGINEERS & FIREMANS EXAMS, 525 Pages . 1
- ☐ PUMPS, Hydraulics & Air Compressors, 1658 Pgs. 4
- ☐ ENGINEERS LIBRARY (3 Book Set) 9
- ☐ MECHANICAL DICTIONARY, 950 Pages . . . 4
- ☐ GARDENERS & GROWERS GUIDES (4 Book Set) 6
- ☐ CARPENTERS & BUILDERS GUIDES (4 Book Set) 6
- ☐ PLUMBERS & Steamfitters Guides (4 Book Set) 6
- ☐ MASONS AND BUILDERS GUIDES (4 Book Set) 6
- ☐ PAINTERS & DECORATORS MANUAL, 450 Pgs. 2
- ☐ HOUSE HEATING GUIDE, 1000 Pages 4
- ☐ OIL BURNER GUIDE, 384 Pages 1

Name _____
Address _____
Occupation _____
Employed by _____ $12

It's Easy to Improve Your Car—Make It Last Longer, Run Better!

Money-Saving Book Makes It Fun to Keep Your Car in Top Order!

7 Days Trial FREE!

Only $2.49

256 Big Pages!
750 Two-Color Pictures!

HOW TO IMPROVE YOUR CAR'S APPEARANCE

HOW TO SAVE ON GAS, BATTERIES, TIRES, OIL, TUBES, ETC.

HOW TO MAKE ACCESSORIES

HOW TO TUNE UP YOUR CAR

HOW TO LOCATE AND REPAIR TROUBLE ON THE ROAD

HOW TO MAKE REPAIRS AT HOME

Complete Step-by-Step Easy-to-Do Pictorized Directions on How to:

- Repaint Entire Car
- Repair Dents, Materials
- Repair Tire Without Removing Wheel
- Make Automatic Garage Doors
- Use Dual Fuels
- Build Own Station Wagon
- Make a Bed in Your Car
- Use Principles of Tune-Up
- Bump Out Fenders
- Pick Out Good Used Cars
- Do Valve Jobs
- Enjoy Skillful Cycling
- Repair Ring Trouble
- Avoid Gas Waste
- Own Easy-to-Make Tractor
- Overhaul Fuel Pump

—and Much More!

YOU, the *average car-owner*, can at last do something about today's high cost of auto maintenance and repairs! And it's so *easy* with the help of the *all-new* volume, "HOW TO TAKE CARE OF YOUR CAR." Simple, nontechnical instructions and colorful "how-to" pictures make it child's play for *you* to deal with any of hundreds of car repair and servicing problems. You'll not only SAVE MONEY, but have a *better-looking, better-working, longer-lasting car!*

Prepared for You by Famous Staff of *Popular Science* Automotive Experts!

This completely up-to-date manual was written and edited by some of the nation's leading automotive authorities. So practical is the valuable advice crowding the pages of this book that it's like having a dozen skilled mechanics at your constant beck and call!

They edited this book just for YOU, the *non-professional*, so that you can keep your car in better shape for a longer time in the critical car-shortage, labor-shortage days now upon us! They've poured their hard-earned years of knowledge and experience into this exciting book to help you beat car-trouble *at home and on the road!*

Now you'll find it easy to put new life, longer life into your car—whether you own a Model T vintage "jalopy" or a "hot-off-the-assembly-line" job. You get a wealth of easy-to-follow text and step-by-step pictures that save you big money! SAVE $14 to $50 by repairing dented fenders; SAVE up to $200 by reupholstering your car for cost of materials alone; SAVE $50 to $75 by doing your own professional-looking paint job; SAVE up to $125 locating, preventing, correcting ring troubles! Learn everything you must know about your car and its parts—valves, brakes, mufflers, lights, tires, rings, fuel, batteries, and ever so much more!

Book will more than pay for itself on your very first job!

Saves You Hundreds of Dollars—Costs Less Than a Tankful of Gas!

Avoid Disappointment! Mail Coupon NOW!

POPULAR SCIENCE PUBLISHING CO., DEPT. 1253
353 Fourth Avenue, New York 10, New York

Yes, without obligation, please send me big *new* auto book, "HOW TO TAKE CARE OF YOUR CAR." When book arrives, I'll pay postman only $2.49 plus a few cents postage. If not more than delighted, I'll return it within 7 days and receive prompt refund.

SAVE MORE! Send full remittance now and we'll stand all packing, shipping and insurance costs. Same refund guarantee!

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

☐ *Check here to see DeLuxe Edition, bound in lifetime Buckram, title stamped in gold. Only 50c extra. Same refund terms!*

SUCCESS • BIG PAY
in Aviation
MASTER A&E MECHANICS
urgently needed

Maximum training in minimum time! Thorough, practical instruction backed by more than 25 years of aviation technical experience. Training authorized under G.I. Bill.

Write today! Illustrated Catalog Registrar, Dept. 91, Miami 30, Florida

Embry Riddle International SCHOOL OF AVIATION

TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

MAKE MONEY Selling ESHELMAN Power Mowers Riding Tractors & Rotary Tillers

RAKES PLOWS CULTIVATES HARROWS HAULS SPRAYS SAWS DOZER MOWS CUTS ROLLS TILLS SNOW PLOW

ESHELMAN FOR Better LAWNS And GARDENS

1 to 8 H.P. Also Walking Tractors Low as $69

WOMEN CAN OPERATE IT. Free Catalog. *Write*
ESHELMAN, Dept. 412
119 Light St., Balto. 2, Md.
333 N. Michigan Ave., Chicago 1, Ill.
7070 Hollywood Blvd., Los Angeles 28, Cal.

$750 BUILDS 4 ROOMS & BATH!
WHY PAY RENT?

For Seven Hundred Fifty Dollars and 30 days of your spare time, you can build yourself this Beautiful Home. Living room, 11x15. Front bedroom 9x11. Back bedroom 10x12. Kitchen 9x11. Bath 5x8. Hall 3x4. Windout steel casement windows. Concrete block, stuccoed. Step-by-step illustrated instructions, blueprint and material list, $1.00 and No COD. Moneyback guarantee. **Economy Home, Box 645, Dept. D, Columbus 16, Ohio**

DON'T BE CAUGHT WITH A DEAD BATTERY

Amazing "New Life" battery rejuvenator stops build-up of plate sulfates . . . keeps battery automatically charged. Use lights, heater, radio, as much as you like. Get faster starting! Greater power! *RECHARGING IS UNNECESSARY!* Only one treatment needed! Money back guarantee. Rush $1.00 to:

JSM PRODUCTS CO. • 11150 Castleton Rd., Cleveland 21, OHIO

MODERN TRANSPARENT ROOF

Plates Repaired $5.00

Genuine Dupont Plastic NEW FALSE PLATE

From Your Old, Loose Plate NO IMPRESSION NEEDED
New, revolutionary Duplication System actually transforms your old, loose, cracked, chipped plate into a new, natural-pink Dupont Plastic Plate with same teeth or new, natural matched teeth. ONE DAY SERVICE!

Only $18.95

SEND NO MONEY—just your name and address for **FREE** details. *Save at our low price!* Highest prices paid for Dental Gold. **ALL-STATE DENTAL LABORATORIES, 22 W. Madison, Dept. 371, Chicago 2.**

30-DAY MONEY-BACK TRIAL

Wheels Wheels Wheels Wheels

7" Disc Wheel 3/4" Tire 3/8" sleeve.....45c ea.
8" Disc Wheel 1 1/8" Tire 1/2" sleeve.....70c ea.
7" Disc Wheel 1" Tire 1/2" ball bearing.....80c ea.
8" Disc Wheel 1 1/8" Tire 1/2" ball bearing.....$1.00 ea.
6" Disc Wheel 1.50 semi-pneum. Tire 1/2" B.B.....$1.35 ea.
8" Disc Wheel 2" semi-pneum. T. 1/2" B.B.....$1.50 ea.
10" Disc Wheel 1.75 semi-pneum. T. 1/2" B.B.....$1.50 ea.
10" Disc Wheel 2.75 semi-pneum. Tire 5/8" B.B.....$3.50 ea.
12" Disc Wheel 1.75 semi-pneum. T. 1/2" B.B.....$1.85 ea.
Above wheel prices includes hub cap. Plus Postage. C.O.D.'s accepted.
AXLES—Sizes 5/16 in., 3/8 in., 1/2 in.—Cut to size—End holes drilled.

UNITED WHEEL STAMPING CO.
12131 S. PEORIA STREET PS12 CHICAGO 43, ILLINOIS

THOUSANDS NOW PLAY
who never thought they could!

WOULDN'T TAKE $1000 FOR COURSE
"The lessons are so simple that anyone can understand them. I have learned to play by note in a little more than a month. I wouldn't take a thousand dollars for my course." *S. E. A., Kansas City, Mo.

PLAYS AT DANCES
"The Piano course I'm taking is the 3rd course with your school. Previously I took Saxophone and Clarinet. Since then I've played a lot of dance jobs." *E. A., Lake View, Iowa.

PLAYS ON RADIO
"I can't keep from telling you that I have a good position playing from KTHS, Hot Springs, Ark., every morning." *J.S., Okla.

You, too, can play any instrument by this EASY A-B-C METHOD

YOU think it's difficult to learn music? That's what thousands of others have thought! Just like you, they longed to play some instrument. But they denied themselves the pleasure—because they thought it took months and years of tedious study to learn.

And then they made an amazing discovery! They learned about a wonderful way to learn music at home—without a private teacher—without tedious study—and in a surprisingly short time. They wrote to the U. S. School of Music about this remarkable short cut method. A free Lesson-Sample actually showed them how easy it was to learn.

The result? Over 900,000 people have studied music at home this simple, A-B-C way. They have found the key to good times, popularity and profit.

And that's what you can do right now. Simply mail the coupon. Get the proof that you, too, can learn to play your favorite instrument—quickly, easily, in spare time at home. Just read the fascinating illustrated booklet—examine the print and picture sample. Tear out the coupon now, before you turn the page. Instruments supplied when needed, cash or credit. **U. S. SCHOOL OF MUSIC, Studio C1512, Port Washington, N. Y.** 55th Successful year. (Established 1898.)

**Actual names on request. Pictures by professional models.*

FREE! Book and Lesson-Sample

U. S. SCHOOL OF MUSIC,
Studio C1512, Port Washington, N. Y.

Send me Free Book and free Lesson-Sample. No salesman is to call upon me. I'm interested in playing (name instrument).....

☐ I do ☐ I do NOT—have an instrument now.

Name.....
(please print)

Address.....

MEN! TRAIN NOW FOR A BIG PAY FUTURE IN

DIESEL

& SCIENTIFIC MOTOR TUNE-UP

- Diesel Construction
- Diesel Engine Repairman
- Diesel Operator
- Industrial Maintenance
- Auto Engine Rebuilding
- Bus & Truck Maintenance

Be a Trained Diesel Man

Go places with DIESEL! Farms, factories and power plants, trains, ships, trucks, busses all use DIESEL POWER . . . all need DIESEL-trained men! You can start your DIESEL training at home, in spare time, with tested, proved U E I training. Course includes practical work on Diesel engines under skilled instructors. You learn the operation, maintenance, servicing of all types of Diesel engines, PLUS Scientific Motor Tune-up.

ACT NOW! If you have mechanical ability, **you'll like Diesel!** High School diploma not necessary. Write now for FREE book, "EARNING POWER IN DIESEL." Act Today!

MAIL NOW FOR FREE BOOK!

UTILITIES ENGINEERING INSTITUTE, Dept. DM-28
2521 Sheffield Ave., Chicago 14, Ill. *(Founded 1907)*

O. K.! Rush, without obligation, FREE Book on DIESEL.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

☐ Check here for information if under 17.

MIRACLE POWER

in Gas and Oil Every 1,000 Miles
Stops Dry Starting Damage

UNLIMITED OPPORTUNITIES IN ENGINEERING

DEGREE IN 27 MONTHS

Study Engineering in this world-famed school. Established 1884. Demand for our graduates exceeds supply. Approved for Korean Vets.

Bachelor of Science Degree in Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (Television) Engineering; Business Administration and Accounting. Also—36 weeks certificate courses in Surveying and Drafting.

Personalized Instruction. Accelerated courses. Non-essentials eliminated. For ambitious, earnest students. Earn your degree in the shortest possible time. Preparatory courses. Placement service.

Extensive Campus. Well equipped, new and modernized buildings; up-to-date labs. Low cost. New terms start quarterly. Enter January, March, June, September.

Mail Coupon Today

TRI-STATE COLLEGE
5123 College Avenue, Angola, Indiana

Please send me free catalog and special information. I am particularly interested in courses as checked:
☐ Mechanical ☐ Civil ☐ Electrical ☐ Chemical ☐ Aeronautical
☐ Radio (Television) ☐ Business Administration ☐ Accounting
☐ Short Diploma Courses

Name .....

Address .....

ELECTRIFY your SEWING MACHINE

NEW LOW PRICE! **$9.95** 1 YEAR GUARANTEE

Buy direct from manufacturer and save! Kit comes fully wired, installed in a jiffy. Fits all machines! You get **ALL-NEW PARTS**

- Motor & Bracket
- AC-DC 115v 60c
- Multi-speed foot control
- Cord set & block
- Easy instructions
- Steel pulley & belt

FREE . . . reg. $2.95 chrome SEWLITE given with every kit.

10 DAY FREE TRIAL—ORDER NOW!

Send no money, pay COD or send money order and we'll pay postage. Please state whether wheel on your machine turns toward you or away from you. Shipping wt. 6 lbs.

SENIOR SEWING MACHINE CO.
Box 147 PS 51 Brooklyn 6, N. Y.

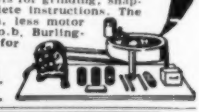
ALPHABET PATTERNS

MULTI-PURPOSE Alphabet Patterns—numerous craft uses. 14 distinctive alphabets-numerals-monograms. Over 500 individual patterns, ½" to 4" high. Only $1.00 Postpaid.

WALKER STUDIO, Dept. AS, 4343 Lindell, St. Louis 8, Mo.

make your own Gems 29.50 F.O.B.

The Gem Maker comes complete with all necessary equipment, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only $29.50, f.o.b. Burlington, Wisconsin. Write today for information and literature.



B & I MANUFACTURING CO.
Dept. S Burlington, Wis.

LOOK HERE MISTER!

UNUSUAL AND UNIQUE NOVELTIES
Rush only 25¢ for surprise samples (worth much more)

FREE! of extra cost GIANT NEW PORTFOLIO-CATALOG IF YOU ACT NOW

HOLLYWOOD SALES CO.
3414 W. MAGNOLIA BLVD. BURBANK 25 CALIF.

PILES

If you suffer from the miseries of itching, bleeding or protruding piles, you may have a generous supply of Page's Palliative Pile Preparations *absolutely free* for the asking. They have relieved pile suffering in hundreds and thousands of cases for more than 50 years.

FREE Trial supply to quickly prove all this, will be sent absolutely free and with no obligation to buy now or later. Send name and address for free trial TODAY!

E. R. PAGE CO. Dept. 45A1, Marshall, Mich.

FORCED AIR

INSTALL IT YOURSELF AND SAVE UP TO $200

CONVERT YOUR GRAVITY FURNACE TO MODERN QUICK FORCED AIR HEAT. INSTALL McLARTY FANS IN YOUR COLD AIR PIPES. NO SHEET METAL WORK REQUIRED. SIMPLE ELECTRIC CONNECTIONS. CALL YOUR HEATING DEALER OR WRITE US.

McLARTY SYSTEMS — 2608 DICKMAN RD. BATTLE CREEK, MICHIGAN

In Canada Write
WINNIPEG SUPPLY & FUEL
WINNIPEG, MANITOBA

FREE CIRCULAR

World's Greatest Hobby For Men and Boys! Get This Free Book. It Tells How You Can Learn to MOUNT BIRDS!

FREE BOOK

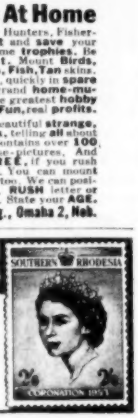
Learn At Home

Men, Boys, Hunters, Fishermen, **mount** and **save** your lovely wild-game **trophies.** Be a **Taxidermist.** Mount **Birds, Animals, Heads, Fish, Tan** skins. **YOU** learn easily, quickly in **spare time.** Have a grand **home-museum.** The finest and the greatest **hobby known,** for sportsmen. **Fun, real profits.**

FREE BOOK Yes, **FREE.** Beautiful **strange,** valuable **Book,** telling **all** about Taxidermy. Contains over **100,** beautiful game-pictures. And it's yours **FREE,** if you rush your request. You can mount **all kinds** of **wild-game,** and common specimens too. We can positively **TEACH YOU.** So **GRASP** this opportunity. **RUSH** letter or postal for this amazing **FREE BOOK.** Don't delay. State your **AGE.**

N. W. SCHOOL OF TAXIDERMY, 2612 Elwood Bldg., Omaha 2, Neb.

FREE! 100 FOREIGN STAMPS



All genuine, unpicked, unsorted — just as received from Europe, Asia, Africa, Near East, Far East — from everywhere! Plus a beautiful souvenir of World's Rarest Stamp and our valuable "Stamp Collector's Guide". Other valuable offers also included for your FREE inspection!

Send 10c for postage and handling to
GARCELON STAMP CO., DEPT. P512
CALAIS, MAINE

DRAINS Cellars, Laundry Tubs; CIRCULATES Oil; IRRIGATES Gardens

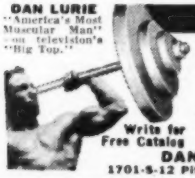
Original "Type P" Pump has 2400 GPH capacity. 360 GPH 75' high, or 1500 GPH from 25' well. Use any ⅛ to ½ HP motor. DOES NOT CLOG. Only $6.95 postpaid if cash with order (West of Mississippi, add 50c.)

$6.95 Motor coupling included

MONEY BACK GUARANTEE!

Also Gear Pumps in all sizes.

LABAWCO PUMPS, BELLE MEAD 3, N. J.



DAN LURIE "America's Most Muscular Man" on television's "Big Top."

FAMOUS DAN LURIE

BARBELLS

with 4 courses—low factory prices

50 lb. set...$ 8.48	150 lb. set...$20.48
100 lb. set... 13.98	200 lb. set... 25.98

Order by Mail; 50% with order, bal. C.O.D. Extra wts. 15c per lb., F.O.B. plant

Write for Free Catalog

DAN LURIE BARBELL CO.
1701-5-12 Pitkin Ave., Dept. 370-M, Brooklyn, N. Y.

tandy RIVETS THE INDISPENSABLE HOUSEHOLD RIVET

INSTANT-PERMANENT FASTENINGS

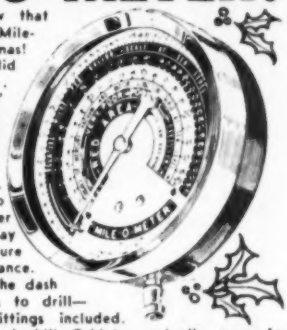
FREE CARD OF 8 RIVETS & CATALOG

Tandy Rivets quickly and permanently fasten Leather, Cloth, Plastic, etc. Ideal for odd jobs you never thought you could do. Send for FREE Card of 8 Rivets and 64-page Catalog. Enclose 10c for shipping.

NATIONWIDE — A TANDY STORE NEAR YOU

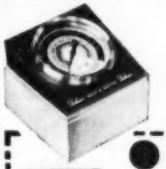
tandy **LEATHER CO.** Since 1919
P. O. BOX 791-HG, Ft. Worth, Tex.

This year...be sure you get the famous MILE-O-METER!



Let your family know that you want the famous Mile-O-Meter this Christmas! Thousands of men did just that last year . . . and were "surprised" with the valuable and useful gift they wanted most! You'll join them in saving money every mile you drive . . . it's what you need to get more miles per gallon, avoid highway breakdowns, and insure top engine performance. Simple to install on the dash of any car—no holes to drill—all directions and fittings included. The chrome and black Mile-O-Meter actually pays for itself over and over again . . . tell your family today!

MILE-O-METER SHOWS



Beautifully gift packaged. Mailed anywhere within 24 hours. Add 35c for Special Delivery. Money-back guarantee!

SEND ____ DELUXE ____ STANDARD MILE-O-METERS AT $ ____

$14.95 Deluxe Illuminated

$9.95 Standard

NAME ____
ADDRESS ____
CITY ____ ZONE ____ STATE ____

☐ Check Enclosed ☐ Money Order Enclosed ☐ Send C.O.D.

We pay postage!

GALE HALL ENGINEERING, INC. DEPT. 398
NORTH HAMPTON, NEW HAMPSHIRE

IT'S FUN TO LEARN

by LINGUAPHONE

World's Standard Conversational Method

FRENCH SPANISH GERMAN RUSSIAN JAPANESE ITALIAN NORWEGIAN

any of 29 languages available

A Linguaphone Language Set is a lasting gift—an invaluable asset in business, travel, school, armed services and social life. With LINGUAPHONE you LISTEN and LEARN another language the same easy, natural way you learned your own—AT HOME you hear native men and women make everyday conversation—you **Understand**—YOU SPEAK! It's like living in another country. Over a million home-study students of all ages. There's nothing like "The Gift of Language." Write TODAY for FREE Book "Passport to a New World of Opportunity." **Linguaphone Institute, 147-12 Mezz., Rockefeller Plaza, New York 20.**

LINGUAPHONE INSTITUTE
147-12 Mezz., Rockefeller Plaza, New York 20, N. Y.
Send me your FREE Book.
LANGUAGE INTERESTED ____
NAME ____
ADDRESS ____
CITY ____ ZONE ____ STATE ____

The NEW way to enjoy SPORTS
Movies, Plays, Nature, Television!

• GET CLOSE-UP VIEWS ALL DAY . . . WITHOUT FATIGUE

The Christmas gift par excellence!

Here for the first time—Germany's famous Spoktoscopes—a revolutionary concept in binoculars. Wear them like ordinary eyeglasses—hour after hour—without fatigue! Only 1 ounce! You'll hardly feel them. Truly powerful optical design! Gives you greater range than some opera glasses selling for much more. Spoktoscopes are ideal for indoors or distant scenes outdoors. Favorable exchange rates and Germany's need for dollars make this amazing value possible! Save $8 or more! To order, simply clip out this ad, writing name and address in margin. Send check or m.o. for $1.98 for fast prepaid delivery. (COD's sent postage collect). Limit 2 per customer. 5-day trial—money back guarantee. Rush! Supply limited.

INTERNATIONAL BINOCULAR COMPANY, Dept. 7-N-90
352 FOURTH AVENUE, NEW YORK 10, N. Y.

SHORTHAND in 6 WEEKS

Famous Speedwriting Shorthand. 120 wpm. No symbols; no machines; use ABC's. Easiest to learn; write and transcribe. Low cost. 200,000 taught by mail. For business and Civil Service. Typing available. 31st year. Write for FREE booklet to:

Speedwriting
Dept. 2612-3, 55 W. 42 St., New York 36 ®

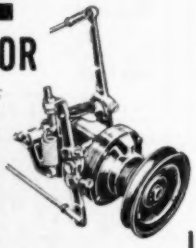
LEARN TO DANCE $1.00

Why be a lonely, unpopular wall-flower?
Learn all the smart dances from the most modern to the old favorites—at home, in private without teacher, music or partner. So simple even a child can learn quickly. Tap dancing, Waltz, Collegiate, Samba, Rhumba, Jitterbug and many others, including illustrations. Complete course only $1.00. Also, delightful old square dances with illustrations for $1.00. Get each Separate or both for $1.98. If you order both take your choice of FREE-DREAM BOOK or LOVE LETTERS. C.O.D. orders 25c extra and Postage.

Superior professional taps, both toes and heels $2.98 prepaid or C.O.D. plus shipping charges. State size, large or small.

ROLLDEX, P. O. Box 516, Dept. D-85, Safety Harbor, Fla.

this ONE GOVERNOR



fits ALL popular farm & industrial gasoline engines

PIERCE LONG RANGE Universal Governor

ONLY **$39.50**

Pulley extra

- Instant variable speed selection and accurate engine control at any speed setting within 1200 to 2600 RPM. Higher and lower ranges obtainable by simple change of pulley. Also "constant speed" operation.
- Accurate, dependable speed control for engines operating corn shellers, drag lines, hoists, arc welders, trucks and tractors with power take-offs, etc.

Send Check or Money Order. State Make, Model of engine.

Write for Complete Information

DEALERSHIPS AVAILABLE

"World's Most Experienced Governor Manufacturer"

THE PIERCE GOVERNOR CO., Inc.
1654 Ohio Avenue, Box 1000
Anderson, Indiana, U. S. A.

MEN WANTED

Earn $100 Per Week and up
AUTO DIESEL MECHANICS

Master a trade with a future—learn Auto-Diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $100 per week and up. No previous experience necessary. Day and night courses. Approved for veterans. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave., N., Dept. 41 — Nashville 3, Tenn.

HE-MAN PHYSIQUE

Thousands now enjoy results from this dynamic new system. **Common Sense** shows you the way to a powerful, more attractive body . . . in an amazingly short time. Write for FREE illustrated brochure.

JOHNSON HEALTH STUDIOS, Dept. M-1
22 E. Van Buren St., Chicago 5, Ill.

STOP REGULATOR and BATTERY TROUBLE

with the AMAZING NEW — PROVEN RELIABLE and SAFE SELECT-A-CHARGE — WATTAGE REGULATOR WITH SAFE E-Z ADJUSTABLE CHARGE BOOSTER SWITCH

★ A new secret electrical circuit formula, Stops Burning and Sticking of contacts. These regulators give years of trouble free service.

- Stop the horror of driving with a half dead battery.
- Increase or double your battery charge and life.
- Hot Hi-Volt spark for smooth sure-fire ignition.
- Get more charge from your small generator safely.
- Get big battery performance from a low cost battery
- Brighter lights — Safer driving — E Z Starting.

DEALERS WANTED — Big Profits

Write • how you can have a demonstrator free!

SCIENTIFIC ELECTRIC CO. • BOX 2162-B • CLEVELAND 8, OHIO

LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. You LEARN BY DOING under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a Profitable store of your own. Remember, PEOPLE MUST EAT! Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established over 25 years. Get National training NOW. Pay your tuition in easy weekly payments after you graduate. Get all the facts. Send coupon for FREE 52 page school catalog—TODAY. G.I. Approved.

National School of Meat Cutting, Inc.
Dept. S1-Y, Toledo 4, Ohio

Send me your FREE school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self Service Meats. No obligation. No salesman will call.

Name.....Age.....

Address.....

City.....State.....

Approved for training Korean Veterans

60 BALLOONS THAT MAKE GIANT CIRCUS ANIMALS $2

Some from 3 ft. to 4 ft. Easy to make GIANT CIRCUS ANIMALS—instructions included. 3½ ft. Giraffe, a yard full of 12" kittens. Make a big SANTA CLAUS, a set of REINDEER, Seal, Kangaroo. FREE with $4.00 order a balloon squawker. FREE with $6.00 order 50 plastic toys. "A Complete Rodeo." Add 10c for postage.

52 PARTY BALLOONS $1.00
in assorted colors & sizes.

50 PLASTIC TOYS $1.00
A complete Rodeo

CIRCUS BALLOONS, Dept. PS-12, Scarsdale, N. Y.

PORTABLE GARAGE

USE IT ANYWHERE!

PLASTIC VINYL

• Goes wherever your car goes • Folds compactly • Keeps rain, dust, salt air, sun away • Protects your car's finish • Durably constructed of vinyl plastic that is long wearing and tough • Nylon threads for extra security • Springtite elasticized bottom, holds securely in all kinds of weather • Fits all makes and models • Machinery, equipment, furniture, stock piles, etc • Direct from manufacturer • Enclose check or money order for $6.95 or $8.95 plus 35c postage, or sent C.O.D. 10-Day Money Back Guarantee.

MARDO SALES CORP., Dept. G-607, 488 Lexington Ave., New York 17, N. Y.

A "GOOD HAND" HELPS YOU SUCCEED!

LEARN TO WRITE WELL

Write Your Name beautifully written, plus special pen-point for shaded writing. *Only 10¢*

OUR 53rd YEAR

Handwriting quickly improves with our easy-to-understand picture lessons! Put your spare time to good use: send today for ☐ FREE BOOKLET, "How to Become a Good Penman," or check volumes wanted below at $1 each: ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Bird & Design Flourishing ☐ Engrossing Alphabets. COMPLETE SET $4.50. Ask for price list of penman's supplies.

TAMBLYN SCHOOL of PENMANSHIP
S. A. Zillor, Pres. 438 Ridge Bldg., Kansas City, Mo., USA

BECOME AN EXPERT IN TRAFFIC

Traffic men earn $4,000 to $10,000 and up. Thousands of firms need experts on rates, tariffs, regulations. We train you thoroly in spare time at home for executive traffic jobs. Personal training under traffic authorities. Placement counsel and help. Write for free 48-page book "Traffic Management—the Fast Growing Profession."

LASALLE Extension University, 417 So. Dearborn St.
A Correspondence Institution Dept. 1283T Chicago 5, Ill.

NOW! START MAKING MONEY IN RADIO - TELEVISION THRU AMAZING 30-DAY INCOME PLAN

SEND FOR FREE BOOK, FREE LESSON AND FACTS ON AMAZING NEW HOME TRAINING PLAN

R. T. S. 30 DAY INCOME PLAN

To meet tremendous current demand for trained men, RTS now inaugurates exciting new plan designed to start you *actually making extra cash* in Radio-Television within 30 days! Quickly qualifies you for good-pay jobs in radio, TV, manufacturing, broadcasting, your own shop, or for *highest ratings* in military service.

LEARN AT HOME, SPARE TIME — BONUS OF 11 KITS RADIO-TV PARTS

Learn-by-doing home instruction includes Giant-Screen TV Set & Superheterodyne Radio which you *build* and *keep*. All this equipment plus professional multitester without one penny of extra cost! Easy now to join thousands of successful RTS graduates in good-pay careers all over the world. Mail Coupon for FREE Book, FREE Lesson, FREE facts on 30-day Income Plan—the most sensational plan ever developed for quick cash in the Radio-TV field.

SPECIAL OFFER FOR ACTION TODAY

Try this custom-shattering plan NOW! You'll agree it's the most streamlined Radio-TV opportunity available! Mail the coupon today!

ALL EQUIPMENT YOURS TO USE AND KEEP

MAIL COUPON - LEARN HOW YOU BUILD AND KEEP GIANT SCREEN TV SET PLUS 11 RADIO-TV KITS

RADIO-TELEVISION TRAINING SCHOOL INC.
Dept. PS12, 5100 South Vermont, Los Angeles 37, California

RADIO-TELEVISION TRAINING SCHOOL INC.
Dept. PS12, 5100 South Vermont, Los Angeles 37, California
Rush Free Book—Free Lesson and All Details on Your 30 Day Income Plan.

Name____ Age____
Address____
City____ State____

TRAINED MEN NEEDED

BIG PAY—GOOD FUTURE

☐ TELEVISION ☐ ELECTRONICS
☐ DIESEL ☐ AUTO

WHY WORK FOR LOW PAY or risk being out of a job??? Usually the properly trained man has a steady job . . . through good times or bad. Even back during DEPRESSION there was a *big demand* for Bailey Trained men.

In only 5½ to 6 months we can train YOU to enter one of the big pay fields!

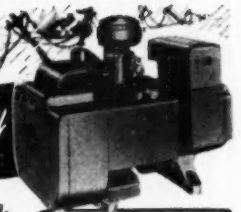
No previous experience or special education necessary. With our method of training you do not spend years pouring over books, figures, charts and graphs. You learn by rebuilding, repairing, testing and operating the most modern equipment, under the guidance of experienced, courteous and friendly instructors. This method of training gives you the experience and confidence required to step right into the big pay jobs without spending years as a mechanic's helper.

It's EASIER and COSTS LESS than you may think to get this residence shop training . . . we help you find part-time jobs while in school—full-time jobs after graduation. Check subject above in which you are interested and mail for complete information.

BAILEY Technical SCHOOLS
Veteran Approved
1624 S. Grand St. Louis 4, Mo.

NAME.....AGE.....
STREET.....
TOWN.....ZONE.....STATE.....

Protect your home against power interruptions with an...



ONAN *Emergency* ELECTRIC PLANT

Provides dependable stand-by electricity for heating system, pumps, freezer, lights, appliances. Keeps home safe, livable. Automatic start and stop. *Find out how little it costs!*

A SIZE FOR EVERY NEED
1,000 to 50,000 watts. Compact, quiet-running, easy to install. Gasoline engine powered.

Write for Folder!

D. W. ONAN & SONS, INC.
6758 University Ave. S. E. • Minneapolis 14, Minnesota

PUMP WATER *FAST!*

DRAIN WASH TUBS, CELLARS, CISTERNS IRRIGATE—FILL TANKS—DRAW WELL WATER

Pumps 2800 GPH. 420 GPH at 75' High or 1600 GPH from 25' well. Sturdy, Rustproof Alloy Metal. Six Blade Impeller. Uses any 1/8 to 1/2 H P Motor. Will not leak or clog. Fits any garden hose. Immediate Money Back Guarantee. Send Check, M O. or C.O.D. **8.95** IN U S

MOORE MANUFACTURING CO.
SWEDESBORO 2 NEW JERSEY

FRONT END LOWERING BLOCKS

Ansen's Lowering Blocks make it easy to lower front end of cars with coil springs 1½" to 2½"—no cutting or welding necessary. Kit complete with parts and instructions **$8.95**
(50% deposit on C.O.D.s). State year & make of car. Dealer inquiries invited.

ANSEN AUTOMOTIVE ENGINEERING INC.
6317 So. Normandie Ave. Dept. PS Los Angeles 44, Calif.

STOP RADIO & TV NOISES *INSTANTLY!*

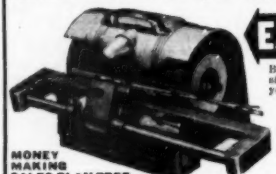
NEW ELECTRONIC DESIGN

Bell-Tronic line filter eliminates noisy interference caused by motor appliances, autos, oil burners, etc. Simply plug radio or TV cord into filter and filter into wall socket. Enjoy Bell Clear reception. Send $1 ppd. No C.O.D. Try 5 days. Money back guarantee. **$1.00 PPD.**

TUBE WHOLESALERS CO.
Box 364, Dept. PS-2, Rockville Centre, N. Y.

ADDRESS
POSTCARDS
AT HOME
MAKE MONEY!! SPARE FULL TIME
write
LINDO, WATERTOWN, MASS.

MAKE UP TO $5 AN HOUR WITH EASISHARP



MONEY MAKING SALES PLAN FREE

Big profits in your spare time sharpening scissors. We show you how to start making money immediately. This is your chance now to have your own business and a steady income. Sharpen a pair of scissors in less than two minutes! A child can operate it. Weighs only 10 lbs. Every home, barber, tailor, dressmaker—everybody uses scissors and all need sharpening two to four times a year. Don't let some one else beat you to this opportunity. Write immediately to

SERR-EDGE MACHINE CO., 9733 Lorain Ave., Cleveland, Ohio

SAVE MONEY • SAVE FUEL • BE WARMER

STORM WINDOWS

OF GENUINE **DU PONT** *CELLULOSE ACETATE*

5 WINDOWS for $6 POSTPAID

- **CLEAR AS GLASS** *No cloudy vinyl plastic effect—but as transparent as the windows it covers.*
- **INSTALL IN MINUTES . . . FROM INSIDE** Scissors and Scotch tape are all you need. No climbing ladders for outside installation! No marring of window sills with tacks. Simply tape on . . . as easy as mending a page!
- **PERMITS AIRING OF ROOMS** *Just lift off tape when open window is desired . . . Replace when window is closed.*

100% AIRTIGHT — Used by the U.S. Gov't. Fit any window. Roll size 36" x 288". Sheets easily taped together to cover wider windows. Completely waterproof . . . Instructions furnished. They'll pay for themselves many times over in fuel savings alone. Fill in and mail the coupon TODAY.

SEND NO MONEY!
Pay Postman
YOUR MONEY BACK IN FULL IF RETURNED IN 10 DAYS

T. C. TOR, 43 Birch Drive, Levittown, Pa., Dept. S-123
GENTLEMEN: Please ship immediately ( ) rolls (ea. roll 36" x 288") — at $6. per roll of TOR Plastic Storm Windows . . . ea. roll enough for five average size storm windows — with instructions.
( ) I will pay postman $..... plus few cents postal collection fee.
( ) Am enclosing payment herewith (saving collection cost)
Name .....
Address .....
City .....

IT'S FREE!

New, exciting booklet . . . . "THE INVISIBLE WORLD and THE WONDERS OF CHEMISTRY"

Big, precision built Sciencecraft microscopes are equipped with velvet touch focusing adjustment, 90 degree inclination joints, fully adjustable mirrors, and spring stage clips. Accurately ground and polished optical glass lenses are carefully synchronized to insure perfect resolving power and definition.

Now available! New, improved triple objective turret microscope. Exclusive index gives complete coverage of large subjects. Magnification 50-150 and 300 diameters. Priced as low as $8.95 . . . Explore the exciting world of science. Send for your free booklet today.

The Porter Chemical Company
53 Prospect Avenue, Hagerstown, Maryland

KROIL LOOSENS RUSTY FROZEN PARTS

creeps in

12,000 industrial plants now use Kroil for emergencies like frozen bolts, pipe threads, bearings, etc. Kroil creeps into millionth inch spaces to dissolve rust and dried grease . . . guaranteed to loosen stuck-together metal parts or money back—gallon $3.85 f.o.b. Factory or send $1.50 for two 8 oz. spout cans postpaid.

KANO LABS., 1031 Thompson Lane, NASHVILLE 11, TENN.

MOTORCADE BARGAIN FROM DETROIT

8 FEET OF CARS!
End-to-end these cars, trucks, trolleys, planes reach almost 8 ft. Fifty true 3-dimensional colorful plastic scale models. Order Now!

50 CARS FOR $1

YOUNG PRODUCTS, Dept. 5077 2605 Elmhurst, Detroit 6 Mich

$2600 MORE A YEAR

in your spare time laundering venetian blinds. Start at home. Expand to full time. Others making over $1000 a month! Small investment for new portable machine. Send for Free booklet today. No salesman will call.

VENETIAN BLIND LAUNDRY EQUIPMENT CO., INC.
442 N. SENECA DEPT. 12-T WICHITA, KANSAS

MAKE MONEY IN YOUR OWN SHOP WITH Plastics

Want to earn extra money—make your own Christmas gifts of professional-looking accessories? Perhaps you've never realized it before, but any hobbyist can do it who has use of the average home shop equipment. And now you can buy raw materials *direct* from a commercial supplier—real Plexiglas in sheets, rods and tubing. A whole new wondrous world of enjoyment awaits you. Immediate delivery. Write now for price list.

PHIPPS & BIRD, INC., P. O. Box 2V, Richmond 5, Va.

METALIZE BABY SHOES

•Instructions Include Complete Kit of Supplies & Beautiful BRONZED BABY SHOE

Add to your present income or have a full-time business. Fill huge demand for most precious keepsakes. Start at once—no big investment. Complete instructions include *all* processing methods. It's fun and very profitable. Start now — SEND NO MONEY — just name and address.

KIKTAVI CO., Dept. S-5312, 7217 S. Broadway, Los Angeles 3, Cal.

FREE

SEND FOR THE

1954 ALLIED

268 value-packed pages

TV & RADIO CATALOG

WORLD'S MOST COMPLETE

Save on everything in TV and RADIO

Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers and Soundmen

Send for ALLIED's big 268-page value-packed buying guide to *everything* in TV and Radio! Largest selections of custom TV chassis, TV accessories, FM and AM radios, High-Fidelity Sound, Amateur supplies, P.A. Systems, recorders, test instruments, builders' kits, industrial electronic supplies—plus the world's largest stocks of electronic parts, tubes, tools and books. Get *everything*—get more for your money—send today for your FREE 1954 ALLIED Catalog.

WORLD'S LARGEST STOCKS

NEW HOME OF ALLIED RADIO

ultra modern facilities TO SERVE YOU BEST

SEND FOR FREE CATALOG

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-M-3
100 N. Western Ave., Chicago 80, Illinois

☐ Rush FREE 1954 ALLIED 268-Page Catalog

Name _____

Address _____

City _____ Zone _____ State _____

PAY LESS on repairs GET MORE from your TV set

You can easily identify trouble, and often fix it yourself; you can increase the clarity of your set with the help of

Mandl's TV Servicing

A HAND CHART shows you where the trouble is when you have "snow," streaks, bad focus, double image or any other flaws in picture or sound. Just run down the trouble column, then turn to the text pages giving detailed, illustrated servicing directions for your particular trouble.

SAVE NEEDLESS EXPENSE

You'll find that you can save many service costs; learn simple, easy-to-make adjustments to improve your set. Thousands of servicemen use this famous book because it is so easy to follow, so thorough and complete.

See it on FREE trial

The Macmillan Co., 60 Fifth Ave., N. Y. 11

Please send me Mandl's TV Servicing. I will either pay the full price of $5.50, plus small delivery charge, or return the book in 10 days. (Save: Send check or money order and we pay delivery charge.)

Signed.....

Address.....

(This offer good only within continental limits of U.S.A.)

NEW Crosman for Christmas

At dealers everywhere

Rifled barrel, .22 cal., high-powered air pistol for indoor-outdoor target shooting.

WRITE FOR CATALOG

CROSMAN ARMS CO., Dept. 46, Fairport, N. Y.

C1 **COLORCRETE**

Drab or dirty masonry—concrete, stucco, etc., becomes gleaming white. Or there's a range of sparkling colors — ivory, cream, pink, blue, green, and 25 more. Colorcrete is fused to masonry surfaces under pneumatic pressure. Stays put and stays beautiful. Highly water resistant. Used for more than a quarter century.

There's Profit-Appeal in Stucco Spraying

The business of applying Colorcrete is a community enterprise, with special appeal to men of limited capital. Equipment is compact, simple to operate, practically wear-proof. Work is easy, interesting and rich in profit potentials. Broad opportunities for development. We supply all equipment and full instructions.

No experience or special ability needed. Write or wire today for the Opportunity Book.

COLORCRETE INDUSTRIES, INC.
572 Ottawa Ave.
Holland, Mich.

STICK WITH LEPAGE'S

For PROFESSIONAL RESULTS
The Home Workshop Glue for EVERY PURPOSE!

LEPAGE'S INC.
GLOUCESTER, MASS.

GLUEMAKERS FOR 74 YEARS

EYE GLASSES by MAIL As low as $1.95

WRITE for FREE CATALOG with 14 LENS SAMPLE CARD

Thousands of Customers
Est. 1929

QUALITY READING-MAGNIFYING OR BIFOCAL GLASSES FOR FAR AND NEAR

ADVANCE SPECTACLE COMPANY, Inc.
537 S. Dearborn St., Dept. SP-12 Chicago 5, Illinois

RUPTURED?

Get Relief This Proven Way

No leg-straps or cutting belts. Automatic adjustable pad follows every body movement with instant increased support in case of strain. Cannot slip. Light. Wear in bath. Send for **FREE** book, "Advice To Ruptured" and liberal 60-day trial offer. (Our 83rd Successful Year)

CLUTHE SONS, Dept. 34, Bloomfield, New Jersey

SEND FOR THIS FREE!

Make money. Know how to break and train horses. *Write today for this book FREE*, together with special offer of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse, check here ( ) *Do it today—now.*

BEERY SCHOOL OF HORSEMANSHIP
Dept. 5812 Pleasant Hill, Ohio

FULL COLOR — LIFE SIZE
(5 FOOT TALL)

MARILYN MONROE

PIN-UP

THE BEST GIFT-GAG EVER—Big as life—twice as natural—lovely Marilyn Monroe, beautifully reproduced 5 feet tall from a full color Kodachrome. The only LIFE SIZE pin-up print. Pin it on the wall or closet door. A perfect gift-gag for the man with a den, bar or playroom. An eye-opener anywhere. Order several—order NOW! Over-all size 62 inches high, 21½ inches wide. Only $2.00 ppd. Send cash, check or M.O. Money back if not fully satisfied.
PIN-UPS, Dept. SC12-3, Box 86, Boston, Mass.

Make $20 to $30 a Day with this new ONE MAN

MAIL ORDER BUSINESS

DO PLASTIC LAMINATING AT HOME!

THIS MAN . . .

. . . is taking out of the machine a Plastic Sealing Job—Ordered by mail—only 11c in material cost brings back $2.58 in cash by mail. Capacity of machine: $25.00 profit per hour of operation.

Would you like to get orders and cash from your mailman—then in space of hours make and ship the things people ordered from you? If you have spare time and a little spare room in kitchen, garage, or basement, get the facts about the newest and most fascinating of all home operated businesses. For the first time a simplified machine brings the fabulous profit of **Plastic Sealing** and **Plastic Laminating** within the reach of the small operator. Any one can learn to operate the machine with a few minutes practice—then with our **Magic Mail Plan** can get mail orders pouring in daily with cash in every envelope. No canvassing—no selling. We even supply the circulars you mail to bring back cash and orders. Don't waste a minute. Rush your name. We'll send you, FREE and postpaid, pictures, prices, details, all the facts you need to start. Mail coupon or send name on postcard. No charge.

WARNER ELECTRIC CO., 1512 Jarvis Av.
DEPT. L-912, • CHICAGO 26, ILLINOIS

Make Thousands of Beautiful Art Creations

COSTUME JEWELRY • CIGARETTE BOXES
TRAYS • CANDLESTICKS • COASTERS
LAMP BASES • BOOK ENDS...ALL IN SPARKLING COLORED PLASTIC

WARNER ELECTRIC CO. 1512 Jarvis Av.
Dept. L-912, Chicago 26, Ill.
At no cost to me, please rush complete details postage prepaid. I am under no obligation.

Name _____
Address _____
City _____ Zone _____ State _____

Only $29.75 complete

$ FREE COURSE! BIG PROFITS! $

Flocks & Sandblasts

Dual Purpose Spray Gun! Uses only 25 lbs. Air Pressure!

● Thousands of uses in Home, Shop, Industry: Makes Auto Interiors Clean & New. Lines drawers, Marproofs lamp bases, Refinishes any object. All in colorful Flock. Etch & Frost windows, glassware, etc. Removes Paint and Rust from Autos, Tools. Guaranteed! Send **$29.75** or write for free information. **Complete Flocking Supplies!**

BLASTO SPRAY GUN MFG.
Dept. PS-12, 7007 Haas Ave., Los Angeles 47, Calif.

MORE JOBS

EASIER—QUICKER

with 'RED-E' GARDEN TRACTORS

You'll like the smooth, powerful, gear-driven, easy operating action of the 4½ or 6 H.P. WALKING MODEL with power turning clutch or the 8½ H.P. RIDING MODEL with automotive type differential. Our 2 and 3 H.P. Walking Models low as $169. Attachments for plowing, sowing, cultivating, wood-sawing, snow-plowing, etc.

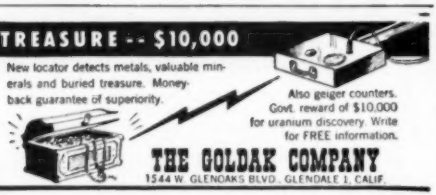
Write for FREE Catalog New 1954 models on Easy Terms—special Factory-To-You discount.

RED-E TRACTOR CO., Richfield 434, Wis.

Fully Guaranteed
BUY DIRECT from Manufacturer and Save

TREASURE -- $10,000

New locator detects metals, valuable minerals and buried treasure. Money-back guarantee of superiority.



Also geiger counters. Govt. reward of $10,000 for uranium discovery. Write for FREE information.

THE GOLDAK COMPANY
1544 W. GLENOAKS BLVD., GLENDALE 1, CALIF.

$2.95 EACH OR 2 FOR $5.00!

Genuine Telephone Company Upright telephone complete with cord in Tested and Guaranteed condition. For intercommunication or extension. Complete line of telephones and parts, inter-communication systems, switchboards, handsets, magneto and dial telephones, etc. Write for free list. C.O.D. orders accepted. All shipments F.O.B.

TELEPHONE ENGINEERING CO.
DEPT. A-A SIMPSON, PA.

PREPARE FOR BETTER JOB, BIGGER PAY IN SPARE TIME AT HOME

Today, choose the job you want—and prepare for it in time you might otherwise waste. Or if you are already in the work you like best, start training now for quicker promotion and increased pay. During more than 50 years AMERICAN SCHOOL has helped ambitious people to reach higher goals. Check subject that interests you and mail coupon for full information.

AMERICAN SCHOOL, Dept. G946, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

☐ Accounting
☐ Air Conditioning
☐ Architecture & Building
☐ Automotive Technician
☐ Better Penmanship
☐ Bookkeeping
☐ Business Management
☐ Contracting
☐ Diesel Technician
☐ Drafting—Building Trades
☐ Drafting—Machine Trades
☐ Electrical Engineering
☐ Electricity—Practical
☐ Electronics—Industrial
☐ High School Courses
☐ Machine Shop Operations
☐ Mathematics & Slide Rule
☐ Mechanical Engineering
☐ Plastics Engineering
☐ Plumbing—Practical
☐ Private Secretary
☐ Refrigeration
☐ Sewer Construction—Digging
☐ Sheet Metal Work
☐ Tool Making

NAME ..... OCCUPATION .....
HOME ADDRESS ..... AGE .....
CITY ..... STATE .....

MAIL COUPON NOW

Sensational OFFER

AUTO REAR SEAT SPEAKER

Attractive grill and trim ring for flush mounting ★ 3-position switch and leads ★ Installation instructions ★ Dealer's list $11.95. Special offer—Now 40% off list ★ Satisfaction guaranteed ★ Send your money order today. Complete postpaid ★ Sorry, no C.O.D.'s. ★ Net to you $7.17.

Ideal Xmas gift!

CURB SIGNAL 6615 EUCLID AVENUE CLEVELAND 3, OHIO

CAPT. LEWIS L. MILLETT
USA

T/SGT. R. S. KENNEMORE
USMC

In all, 104 men have won the Medal of Honor in Korea. The men here stand as representatives of them—and of all the service men and women to whose devotion we in America owe our security this Christmas of 1953.

LT. COL. R. R. MYERS
USMC

LT. THOMAS HUDNER, JR.
USN

Peace...

their Christmas Wish for us!

PFC. H. A. CAFFERATA, JR.
USMCR

M/SGT. HAROLD E. WILSON
USMCR

THESE are some of the bravest men on earth. Yet these young holders of the Medal of Honor were never fighters for the love of fighting. They are men of war with a dream of peace.

They want a world in which small wide eyes can gaze in rapture at a tinselled tree. Where a happy Christmas is a child's inalienable right—because fear and force have at last given way to peace and law and goodwill. They have fought ably for peace, with courage "above and beyond the call of duty." Can we, at home, do something for it, too?

Yes. Beginning now, each of us who earns can put some part of his earnings into United States Defense Bonds. For by these Bonds we make our own families secure, first of all. Then, out of the security of our families, we build the strength of America—to *stay* at peace in a world where peace still is only for the strong.

You can invest in Defense Bonds *best* through the Payroll Savings Plan where you work or the Bond-A-Month Plan where you bank. Won't you begin—today?

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

PLASTIC LAMINATING

This remarkable plastic laminating machine will earn $18 an hour right in your home! Big profits are guaranteed laminating CARDS of all kinds, Business Cards, Social Security Cards, Identification Cards, Credit Cards, photos, passes, driver's licenses, newspaper clippings, souvenirs, etc. The perfect way to preserve all sorts of valuable PAPERS permanently. Demand for such a service is staggering. Operate a profitable business at home . . . we show you how! Price complete (illus.) only $35 plus postage. Write now. Free sample and literature. Dept. A.

PLASTICAST CO., P.O. Box 6737, Chicago 80, Ill. or P.O. Box 987, Palo Alto, Calif.

POWERFUL! LOW COST!
Light • Rugged • Maneuverable

America's best tractor value More usable power — pulling, pushing, driving. 770 LBS. Pulls 12 in. plow. 8.4 H.P. B&S engine. Gear drive. B-W 4 speed Trans., Clutch, Diff Roller Bearings. Full line implements. 100% satisfaction guaranteed

Write for FREE CATALOG
COUNTRY SQUIRE TRACTOR CO.
P.O. Box 107-A-12
Muskego, Wisconsin

U-BUILD-IT TRAILERS FOR SPORT OR HOME FROM $399

A size for every need from 14' up. High strength steel prefabricated chassis and frame work. Factory made parts. No experience necessary. Kit of tools with electric drill furnished. Send 25¢ for sample plan and literature.

MIDWEST METAL PRODUCTS, P. O. Box 272
Elkhart, Indiana

TOOLS WHOLESALE

Start Your Own Business
Sell tools to your friends, neighbors, etc., part time—full time.
A MILLION DOLLAR INVENTORY AT YOUR FINGERTIPS
Send $1 for Dealer's Card and Wholesale Catalog.

MAKE EXTRA MONEY!

Stanley, Miller Falls, Plumb, Disston, Wiss, and others at 30 to 50% off.

SILVO HARDWARE CO., Dept. S, 108 Market St., Phila. 6, Pa.

BUY IT WHOLESALE!

GET UP TO 40% OFF

☆ Start a Buying Service at Home.
SPARETIME, GET BIG-NAME MERCHANDISE FOR SELF AND CLIENTS UP TO 40% LESS THAN REG. PRICE. SALES EASY, AS YOU CAN GIVE SIZEABLE DISCOUNTS. STILL MAKE FAT COMMISSIONS.
Post Card brings FREE COPY "The Wholesale Plan".

FREE! "THE WHOLESALE PLAN"

American Buyers Service
631-PS LINDEN AVE., BUFFALO 16, N. Y.

JOHN CITIZEN'S OIL LANDS

U. S. citizens have equal rights with oil companies seeking oil on public land. Without leaving home you can file for U. S. oil leases in oil states like California, Wyoming, Colorado, New Mexico, Utah, Montana. Some have profited as high as $250,000 for $250; $11,000 monthly for $200 by filing, letting others develop. Send for free booklet.

CALIFORNIA LEASE CO.
7075-PS Hollywood Blvd. Los Angeles 28, Calif.

YOU can acquire LAW NIGHTS AT HOME! LL. B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 1283L Chicago 5, Ill.

Send me your two FREE booklets described above, without obligation.

*Name*_____ *Age*_____
*Street*_____
*City, Zone & State*_____

STOP BURNING OIL!

K. O. ENGINE WEAR!
With This Terrific 1-2 Combination...

Ring-Re-Nu TRADE MARK **and P.V.R. Compound**

● Your car gets new pep, new power with amazing RING-RE-NU and P.V.R. Compound. Eliminate costly overhaul, cut oil and gas waste this easy way—simply pour hardhitting P.V.R. Compound into your carburetor—cleans engine of tars, gums, and varnish—then squeeze heavy-duty RING-RE-NU into cylinders—restores compression and "new car" power! stops oil burning!—good for 10,000 plus miles. Guaranteed harmless to the finest engine.

● **Read one of thousands of enthusiastic reports!** CADILLAC OWNER, E.L.G. Lawrence, Mass. writes: "My Cadillac was burning 2 qts. of oil every 100 miles. I have now travelled 400 miles since installing Ring-Re-Nu and P.V.R. Compound. Haven't used one drop of oil. Further, my gas consumption has been cut in half. I'm more than pleased with results."

●For reduced oil burning—for lower gas consumption—for power-packed economical performance—ORDER Ring-Re-Nu. Only $4.95 postpaid, (C.O.D.'s, $1.00 deposit, bal. plus post. on arrival). Takes only 30 minutes to install. Send $4.95 with year and make of car.

(Free Folder Available on Request)

RICHIE DISTRIBUTING, INC.
11916 Madison Ave., Dept. 812 Cleveland 7, Ohio

The perfect, lasting gift for any motorist!

Swivel mounted on the windshield molding, this engine analyzer and driving gauge tells how to get more miles per gallon—top engine performance, as you drive! Motor Minder gives a constant, accurate check on valves, carburetor, spark plugs, piston rings, timing, etc. Installation is simple and quick! Dial is illuminated for night driving.

Get it at your dealer's. If he cannot supply you, send us his name and address with your check or money order for $10.95. Motor Minder will be sent prepaid!

Pays for itself in a hurry! **Only $10.95** *In Gay Holiday Gift Wrap!*

STEWART-WARNER

Instrument Div., Dept. P-123, 1840 Diversey Pky., Chicago 14, Ill.

Start a NEW BUSINESS!

or Add to your present Repair Business

SHARPEN DULL PIPE WRENCHES

PIPE TAPS & DIES
"GUM" CIRCULAR SAWS

Write for Information

J. C. MOORE INDUSTRIES
BOX S 276, Fredonia, Pa.

ENGINEERING DEGREE IN 27 MONTHS

Big Demand for Graduates

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and RADIO ENGINEERING (inc. TV and Electronics).

Hundreds of young men are earning **B.S. ENGINEERING DEGREES** annually in this recognized institution—year around operation. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center.

Low tuition. Competent instruction. Thorough, intense practical program. Modern, well-equipped laboratories including new physics laboratory and modern wind tunnel. Individualized instruction emphasized.

Gov't approved for G.I.'s. Engineering preparatory courses. Students from 48 states and 21 foreign countries. Enter December, March, June, September. Send coupon for free catalog and full information. Enroll now.

SEND COUPON TODAY

INDIANA TECHNICAL COLLEGE
6123 E. Washington Boulevard
Fort Wayne 2, Indiana

Please send me free information on B. S. Engineering degree in 27 months as checked.

☐ Aeronautical, ☐ Chemical, ☐ Civil,
☐ Electrical, ☐ Mechanical, ☐ Radio-Television.

Name.....

Address.....

Save UP TO 20% on QUALITY BALL-BEARING WHEELS

TOP QUALITY AT ROCK-BOTTOM PRICES! Stamped steel wheels at savings up to 20%—rust-resistant and built for rugged service. Semi-pneumatic tires, heavy red enameled finish; ball bearings for ½" axle diam. (O.E.M. inquiries invited.)

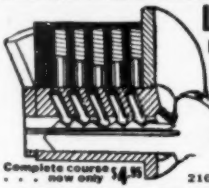
SIZE	MAXIMUM LOAD	ONLY
6x1.50	50 lbs.	$1.50
8x1.75	80 lbs.	1.95
10x1.75	100 lbs.	2.30
10x2.00	140 lbs.	2.65
10x2.75	300 lbs.	4.50
10x2.75*	185 lbs.	6.50

*Pneumatic balloon tires

10-DAY RETURN PRIVILEGE. We guarantee no better wheels are made regardless of price!

Order Now—Send cash, check, or M.O., pay shipping charges on delivery.

ROTARY WHEEL CO.
Dept. S-12, 710 E. 12th St., Kansas City, Mo.

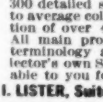


Locksmithing AND KEY MAKING

Now Made Easy! Practical up-to-date course teaches you how to pick locks, de-code, make master keys, repair, install, service, etc. New self-instruction lesson for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 easy illustrated lessons. Full price only $4.95, postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Complete course . . . now only $4.95

Nelson-Hall Co., Dept. MX-1
210 S. Clinton St., Chicago 6, Ill.



PISTOL Sketchbook

Accurate, Authentic Hand Drawings of guns in some of the world's famous collections. Over 300 detailed sketches of guns and accessories available to average collector. Gives immediate visual identification of over 400 pistols from 15th to 20th Century. All main proof marks. Visual dictionary of pistol terminology and their historical evolution. This collector's own Sketchbook of Pistols now available to you for the VERY FIRST TIME. **$2.50**

I. LISTER, Suite 400-B, 1015 Chestnut St., Phila. 7, Pa.

STRATEX DRAFTING FURNITURE FITS TIGHTS BUDGETS!

It costs less to buy the best when you buy direct! Guaranteed Stratex equipment fits any wallet, any space, any requirement — lovely to look at too! Free data.

STRATEX INSTRUMENT CO., INC.
1861G HILLHURST, LOS ANGELES 27, CALIF.

RUPTURE

RELIEF...OR YOUR MONEY BACK
Write now for free booklet and pictures of rupture care. You can be helped...work steady, with low cost, easy to wear Web Truss, thousands satisfied.

WEB TRUSS CO. **Dept. PS-12, Hagerstown, Maryland**

60 POWER TELESCOPE $3.98

VARIABLE EYEPIECE 20x-40x-60x—BRASS BOUND

NEW! Three telescopes in one, 3 different magnifications, 20 power for ultra-bright images with 40 and 60 power for extra long range. Guaranteed to bring distant object, people, sports events, ships, moon, stars, etc. 60 times as close. Made in U.S.A.

Most powerful for anywhere near the money. 5 Sections. Closes to 1 ft. long. Contains 4 ground and polished lenses. Also used as a powerful compound microscope. Directions included. Mass production enables us to offer this instrument at amazing price of $3.98 complete. Money back guarantee. We pay postage. Get yours now.

As A Microscope

CRITERION CO.
DEPT. PSB 16
331 CHURCH ST.
HARTFORD 3, CONN.

MEN-WOMEN RAISE

ORCHIDS

IN YOUR LIVING ROOM!

Successful Home Grower Shows You How

Louis Schirmer, successful home grower, shows you step-by-step how he and Mrs. Schirmer started with a few plants at home, developed a **big-profit business,** and grew an Orchid collection now worth a fortune. **Learn how Orchids multiply**—how one plant may become many, each as valuable as the first. No big investment. No overhead. Takes few minutes a week. Big-profit orders come from individuals, florists, hotels, clubs, etc. Popular year-round gift. **Millions sold by Mail-Order.** Schirmer shows you how!

Grow Georgeous Orchids like this in your own home!

PLANTS AND INSTRUCTIONS Send for NO-RISK Examination!

Complete Directions—secrets of the experts . . . in simple language, jam-packed with "show-how" drawings, gorgeous full-color pictures of Orchids. Also real blooming-size Orchid plants from the Schirmer's own Gardens. **Everything you need to start** is yours to **examinine at home, without risk.** Free—full details. Learn how you may become an Orchid Grower. **Send no money! Write today. Airmail is quickest.**

YEAR 'ROUND NO GREENHOUSE NEEDED ANY CLIMATE—MAINE TO CALIFORNIA

BIG PROFITS! Spare or Full Time. Loads of Fun for all the Family!

Fill your home with gorgeous Tropical Orchids. Raise them to wear or to sell at high prices—the same huge purple Cattleyas you see in nearly every flower shop. Also exquisite Cymbidiums, sometimes with **30 or more blooms on each stalk.** Hundreds of others—many **grow without soil,** getting food **from the air.** Yellow Orchids, greens, blues, pinks, browns, every rainbow color. **No greenhouse needed.** Start on card table in your living room. **Any climate,** Maine to California. **Airmail coupon now.**

[redacted] Help!

"A wonderful course, written so anyone can understand it" —J. G., Mich.

"I can sell all the Orchids I can produce" —M. H., Idaho

"Am very proud of my course and plants . . . Our florist says he will buy my Orchids" —R. P., Arkansas

MAIL COUPON NOW! SEND NO MONEY... JUST YOUR NAME!

TROPICAL FLOWERLAND, Dept. 2C 4622 Wilshire Blvd., Los Angeles 5, Calif.

Tropical Flowerland Dept. 2C
4622 Wilshire, Los Angeles 5, Calif.

Rush me complete free details on your offer of Louis Schirmer's Instructions which show me how to grow Tropical Orchids at home. The instructions will include a blooming-size Orchid Plant and valuable home Profit-Plan. This request does not obligate me in any way.

Name _____

Address _____

City _____

ELECTRIC SHEAR SHARPENER

Over 90,000 Sold—It Must Be Good

Genuine Carborundum wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue.

Motor driven **$9.75** complete with vise

WILLIAM MARVY COMPANY, Dept. P-12
479 St. Peter Street St. Paul 2, Minn.

Trade where you see this sign

POWERFUL PALM-SIZE RADIO

HEARING AID BATTERY POWERED

A mighty miniature of ELECTRONIC VALUE. GUARANTEED PERFORMANCE. Enjoy private listening pleasure at home, office, camp. Detroit Scoutmaster writes, "Wired kit easily. It's sensational . . . really pulls them in". POWERFUL LOW DRAIN, HIGH GAIN SENSITIVE CIRCUIT receives standard broadcast signals up to 1400 miles.

$6.75 kit with instructions

Factory Assembled **$8.95**

ALNICO MAGNET EAR SET, $1.45. Midget batteries, $1.50 per set. POSTPAID. $1.00 deposit on COD orders. All parts FULLY GUARANTEED.

PRECISION ELECTRONICS, DEPT. J
PLACERVILLE, CALIF.

FREE!

GET ALL THESE 5 PICTURE-PACKED COURSES Plus "Amazing Secrets" PHOTO BOOK If you mail coupon NOW! Millions have been sold at $1.

Quit being a BAG of BONES Weakling Like I Was

IN 10 MINUTES OF FUN A DAY YOU Can DO ALL I did!

I gained 25 Terrific Lbs. of HANDSOME POWER-PACKED MUSCLES all over!

I Improved My HE-MAN Looks 1000%

I Won NEW STRENGTH-POPULARITY

NO! I don't care how skinny or flabby you are. I'll make you OVER by the SAME method I turned myself from a wreck to the strongest of the strong. DEVELOP YOUR 520 MUSCLES.

YES! You'll see INCHES of mighty muscles added. From head to heels you'll gain SIZE, POWER, SPEED. SHOW YOU CAN WIN A BIG 15" TALL SILVER CUP and $100 as I just did.

Mail Coupon TODAY

LAST CHANCE COUPON—5 COURSES FREE!

ADONIS INSTITUTE, Dept. PS-312
[illegible]

Dear George: Please mail to me prepaid FREE Jowett's Photo Book of Strong Men, a Muscle Builder plan and 5 Short-Cut Courses, "How to Become a Mighty He-Man." (ENCLOSED FIND 10c for postage and handling on C.O.D.'s).

NAME _____ AGE _____
(Please print plainly. Include Zone Number)

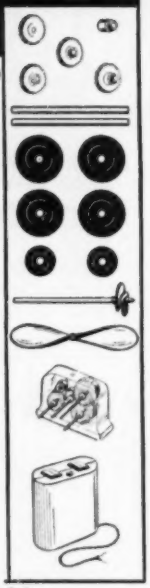
ADDRESS _____

CITY _____ ZONE & STATE _____

ELECTRIC MOTOR $4.98

POWER KIT & ACCESSORIES

FOR TRAINS, PLANES, BOATS, CARS!



FELLOWS! Now in one great kit you get the Power Plant-Forwards and Reverse-Switches-The Gears, Couplings, Gear Box, Shafts and Bushings, Airplane wheels and Landing Gear, Boat Screws-Propeller-Auto Wheels, Axles, Battery Control Box and Hook up Wires—All this **PLUS** a Powerful Miniature Motor that needs **no Transformer**—Measures 1 x 1 x ¼ and turns up more than **6000 RPM** and reverses instantly. Think of the fun, the education in building and operating your own models of boats, cars, trucks, tractors, trains, cranes, drawbridges, Fans or anything you want to make **GO** with a flip of a switch. With the Gear Box and Multi-Ratio Gears you can speed up or Reduce the speed and action to fit your wheels. You can use direct drive-Belt or Gears to supply the type of power you need and handled through the Remote Control Battery Power Pack. You get more than 35 items in this Motor Power Kit for only $4.98. Order one or more now. Send your name and address—Enclose Check or Money Order for $4.98 and this wonderful kit will be rushed to you. On C.O.D.'s you pay approximately $1.00 more.

IMPERIAL SALES CO.

114 East 47th Street, Dept. MK-17, New York 17, N.Y.

The SPEEDY STITCHER

Sews quick and strong, making new or repairing all sorts of leather and canvas articles—boots, shoes, coats, gloves, belts, saddles, golf bags, Ski, Football, Baseball, Skating, Hunting, Fishing, Camping togs, grain bags, burlap, etc.

Each stitcher comes ready to use with a reel of waxed thread and 3 needles, assorted sizes. Needles are carried in handle. A handy tool for home or on hunting, fishing or camping trips.

Price Postage prepaid $1.00

LYMAN BRADFORD CO.

Box No. 350 KINGSTON, MASS.

NEW "PAINT PEN"

PAINT STRIPING TOOL

Works like a Fountain Pen

Stripes with Paint instead of Ink!

This amazing new "PAINT PEN" is a Paint Striping Tool that makes it easy to do expert striping on furniture, bikes, model planes, autos, signs, toys, linoleum, wall board, etc. Makes plain, painted walls look like tile. Paint straight, curved, circular or evenly spaced parallel lines the same way a professional painter does. Simply fill Tubular Glass Paint Fountain with any color paint and wheel tip feeds paint evenly. Tips interchangeable—jaws split apart for easy cleaning. Tool complete with tip for 1-16 inch stripe only $1.00 postpaid. Other complete tools with 1-64, 1-32, 3-64, 5-64, 3-32, 1-8 in. tips, $1.50ea. Extra tips, 75c ea. Complete KIT with 7 tips, $5.00. Also 1-4in tip only, $1.00. COD's postage collect. Here's the handiest tool in your whole painter's kit. Get yours today.

Paint

STRAIGHT, CURVED OR PARALLEL LINES

•

Home Craftsmen

Just the tool you've been waiting for! New Paint Striping Tool gives "professional" results every time, yet simple and easy to use as a fountain pen. Adjustable guide keeps lines straight as an arrow. Just as easy to make curves or free hand designs. Adds new beauty and finished look to everything you paint. Send $1 now!

DEALERS

PAINT STRIPING TOOL packed in display cartons of 1 doz. Fast, profitable seller. Write for illustrated circular, discounts

Only **$1.00**

WENDELL MFG. CO., Dept. 212

4234 LINCOLN AVENUE, CHICAGO 18, ILL.

INSURED TIRE SERVICE POPULAR BRANDS

FREE INSURANCE POLICY given with each used tire sold. We guarantee the amount of service you pay for.

Tube Given Free with Each Used Passenger Tire Upon Request

SPECIAL! Deduct 10% on orders for Two or More used tires

YOU CAN'T LOSE!!

Super Quality — Rugged Performance — 13 Months Insured Service							
600x16	$4.55	670x15	$5.25	700x16	$5.55	760x16	$6.35
650x15	4.95	670x16	5.35	710x15	5.45	820x15	6.45
650x16	5.45	700x15	5.40	760x15	5.95	950x17	4.75

Supreme Quality, Nothing Finer — 39 Months Insured Service							
450x20	5.95	450x21	6.25	700x15(6)	10.45	750x16(6)	15.95
600x16	5.65	650x15	5.75	600x20	10.95	900x20	19.95
650x16	5.85	670x15	5.95	650x20	11.75	1000x20	20.45
700x16	7.75	700x15	5.75	700x20	12.50	1100x20	26.75
750x16	12.50	710x15	6.50	32x6(8)	11.95	1000x22	19.50
550x17	5.75	760x15	6.95	32x6(10)	12.75	1100x22	24.75
525x18	5.45	820x15	7.50	750x20	14.50	1200x20	23.50
640x15	5.75	475x19	5.75	825x20	21.50	1100x24	22.75

MIDLAND TIRE SALES

Speedy shipments on Mail Orders. F.O.B. Chicago. Insurance Policy sent with each order. Deduct 10% on orders for 2 or more used tires. Send CHECK or MONEY ORDER. No COD's.

449 W. 37th Street, Dept. SS-14, Chicago 9, Ill.

Free Catalog of 3000 Novelties

Send for amazing catalog of novelties, live animals, scientific supplies, hobbies, funmakers, planes & boats, looms, magic tricks, joke articles, unusual seeds, gadget timesavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, auto & bike accessories, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, books, games, plants, etc. Send coin or stamp for postage.

JOHNSON SMITH & CO., Dept. 696 Detroit 7, Michigan

FREE 156 PAGE 1954 B-A CATALOG

Complete guide to Everything in Radio, TV and Electronics for Dealers, Servicemen, Schools, Amateurs, Broadcasters, Public Utilities, Engineers, Experimenters, Factories and Laboratories.

BURSTEIN-APPLEBEE CO., 1012 McGEE ST., KANSAS CITY, MO.

THE KEY TO POWER

Life is law and never luck!

Create the future you desire by learning to control your subconscious mind. Free booklet. Write to

KEY TO POWER

Dept. PS, 7321 Beverly Blvd. Los Angeles 36, Calif.

Free Book on Arthritis And Rheumatism

HOW TO AVOID CRIPPLING DEFORMITIES

Explains why drugs and medicines give only temporary relief and fail to remove the causes; tells all about a specialized non-surgical, non-medical treatment which has proven successful for the past 33 years. Write for this 44-page FREE BOOK today.

Ball Clinic Dept. 36 Excelsior Springs, Mo.

CUT BUILDING COSTS ⅔

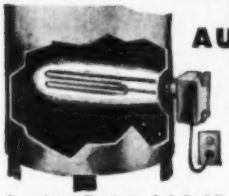
Make Your Own Concrete BLOCKS and BRICKS To Use or Sell

New superior moulds make absolutely square, true, easy-to-lay blocks which will pass any building code. Production is fast . . . easy. One durable $30 machine will make four 5"x8"x12" blocks per minute—1,000 a day. Pays for itself in one day! Sell blocks for big profit . . . or save ⅔ building cost for yourself. POST CARD BRINGS FREE FOLDER.

ECONOMY MFG. CO.

DEPT. S STONE MOUNTAIN, GA.

New Low Cost Electric Water Heater Gives You



HOT WATER AUTOMATICALLY

From Your Present Tank!

- **No dirt, grime, soot, flame!**
- **SAFE! Every part UL approved!**
- **Install in 10 Minutes, or less!**
- **No new tanks or plumbing.**
- **Works automatically, saves fuel!**

New, UL approved LECTROMATIC changes gas, coal or oil-burning water heater into modern ALL-ELECTRIC unit! Turns on automatically when needed, shuts off automatically when water is heated. To install, simply shut off water. Remove plug from water tank. Screw LECTROMATIC into opening (as shown), then PLUG IN 110 volt outlet. Uses 1250 watts. Plenty of hot water all day long. Uses only ¼-½c electricity per gal. of hot water. Temp. adjustable from 100 to 180 degrees. Only $19.95 C.O.D. plus shipping or send check or money order for $19.95 now and we pay shipping. (Also 220 V., 2000 W. model $21.95) Money back in ten days if not delighted. Full one year guarantee! ORDER NOW!

Complete—Ready to Plug In—Only $19.95

COLLOID EQUIPMENT Co. Inc. Dept. PS-12, 19 Murray Street NEW YORK 7, N. Y.

1954 CATALOG—Send 25c

41 models for '54! See World's finest line before you buy. Rated tops in design, styling, performance by the experts. '54 Catalog plus booklet "Boat Selection, Operation, Maintenance" $1.00

Custom-Craft THE ORIGINAL "PACKAGED" BOAT KITS

BOAT PLANS AND FULL-SIZE: PATTERNS

Over 100 Modern plans and full size patterns. Racing classes, cruisers, inboards, outboards, sail boats. By famous designers. 6' to 30'. DESIGN CATALOG only 35¢. For Design Catalog plus boat building handbook send $1.00.

CUSTOM-CRAFT (DEPT. B) BUFFALO 7, N. Y.

AMAZING NEW POCKET SIZE RADIO

Really Works—Small as a Pack of Cigarettes!

FITS IN ANY POCKET OR PURSE—GETS LOCAL RADIO STATIONS WITH CLEAR BELL-LIKE TONE—NO STATIC OR INTERFERENCE! NEEDS NO TUBES, BATTERIES OR COMPLICATED HOOKUPS! NO AC PLUG INS! Nothing to wear out. Thousands of users—many report years of service. Uses new crystal diode and HI-Q coil. SELF-CONTAINED SPEAKER PHONE. Just the tiny radio to take with you ANYWHERE YOU GO—ON TRIPS, VISITING, ETC.—for real fun and enjoyment—ANYTIME. **SEND ONLY $1.00** (bill, ck., mo.) and pay postman $3.99 C.O.D. postage or send $4.99 for p.p. delivery. COMPLETE READY TO LISTEN.

MIDWAY CO., Dept. PPS-12, Kearney, Nebr.

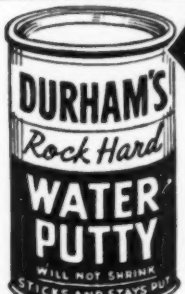
WHAM-O SPORTSMAN *

$1.50 POSTPAID 35-LB. PULL!

HITS LIKE A RIFLE—
KILLS RABBITS, SQUIRRELS.
Powerful, silent, accurate.
For hunting, target, routing pests.
Sportsman's choice sold world over!

HUNTING SLINGSHOT

Heavy duty 7" ash stock.
40 steel balls, extra rubber, target.
GUARANTEED. At dealers, or send $1.50 to
Wham-O Mfg. Co. Box C-8, South Pasadena, Calif.
*** Professional model of Nat'l Slingshot Assn.**



The Modern PLASTIC for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. If unobtainable from your lumber, paint or hardware dealer, the big 4-lb. can will be sent you postpaid (in U.S.) for only $1.25. Full money-back guarantee, order now.

DONALD DURHAM CO.
313 School St., Des Moines, Iowa

EARN MORE IN DRAFTING

MORE OPPORTUNITIES for EMPLOYMENT and PROMOTION

"Here I am at work making good money as a draftsman. I'm glad I sent the coupon to Chicago Tech for that Free Trial Lesson and found out how easy it is to learn Drafting in spare time at home. Today I feel secure in my job because the draftsman's work comes first on any new project. And, in addition, draftsmen can't be replaced with machines. What's more, I feel I'm slated for promotion and more pay, because I see so many draftsmen advancing to high-pay jobs."

LEARN IN SPARE TIME—AT HOME!

(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. All the tools you need; drawing outfit included. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 49 years of C.T.C. progress—prepares men quickly for good positions in industry.

FREE INFORMATION — SEND COUPON

To prove to you how easy it is to learn Drafting at home by the Chicago Tech method, we will send you this FREE TRIAL LESSON. No charge for this lesson, now or later. Fill out and mail coupon, or send post card today.

CHICAGO TECHNICAL COLLEGE

S-221 Tech Bldg., 2000 So. Michigan Ave., Chicago 16, Illinois
Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name.....Age.....

Address.....

City.....Zone....State.....

BE A WELL-PAID TELEVISION SERVICE TECHNICIAN!

NOW—For the First Time an Exclusive TV Service Training Program—7 months' Shop Training Qualifies You.

Get the inside facts on how you can step into the top professional $5,000 to $10,000 per year bracket of TV servicing. Free book tells you how. Master TV servicing QUICKLY by working on real live equipment right in our BIG SHOPS and LABORATORIES in America's Leading TV Servicing School. Shop trained men get the better jobs. WTI graduates win faster promotion . . . can demand better pay . . . develop highly profitable businesses of their own — with the latest and most complete PRACTICAL PERSONALIZED TRAINING BEHIND THEM. Non-essential math and engineering theory omitted. YOU CAN EARN WHILE YOU LEARN. LOW TUITION PLAN. Approved for Veterans. WTI Graduates in Big Demand. Send for your copy of this fact-packed book NOW!

SEND FOR FREE COPY TODAY!

WESTERN TELEVISION INSTITUTE Dept. M-12-3
341 W. 18th St., Los Angeles 15, Calif.
Without obligation, please send FREE fully illustrated booklet. (No salesman will call.)

NAME_____AGE_____

ADDRESS_____

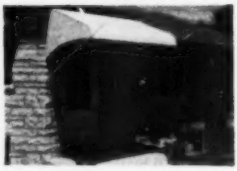
CITY_____ZONE_____STATE_____

Make Your Own!

ASSEMBLE AMERICA'S Most Beautiful ALL-ALUMINUM DOOR CANOPIES AND WINDOW AWNINGS

- THE ONLY TOOL YOU NEED IS A SCREWDRIVER
- These awnings are pre-treated, ready for paint. It's easy! Just do the top — the sides are assembled. Designed and engineered by Herbert's — with experience and machinery to sell you a better awning.
- AVAILABLE COMPLETELY ASSEMBLED WITH BAKED ENAMELED FINISH.

WRITE FOR FREE MEASURING CHART AND LITERATURE



DIRECT FROM FACTORY

Save 50%

8974 St. Charles Rd. Herbert's Aluminum Awnings St. Louis 14, Mo.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZONE _____

UP TO 6 MILES MORE PER GALLON

Reported by Hundreds Using

MIRACLE ACTION TUR-B-LIZER

Carburetor specialists say Tur-B-lizer is best patented improvement they have seen. Tested in millions of miles of driving in cars, trucks and tractors. Easily installed. Send $3.00 for six cylinder type, $4.50 for eight cylinder type. Try Tur-B-lizer for 30 days. If you are not enthusiastically satisfied as claimed by hundreds of users, your money will be promptly refunded.

Mechanics-Salesmen: Make big money selling and installing. Write for full facts.

UNIVERSAL TUR-B-LIZER CO.
625 E. STATE ST. MILWAUKEE 2, WISC.

New! ALL PLASTIC QUICKIE KITS

ALL FOUR ONLY $3.16

Famous Antique Autos you can assemble in 5 minutes

NO SANDING — NO CARVING

FOR COLLECTORS OF ALL AGES

At your Hobby, Toy and Department Store OR SEND DIRECT — All 4 Kits for $3.16 plus 25¢ for postage and handling.

SCRANTON HOBBY CENTER **LiL' OLD TIMERS**
Dept. L 28 • 329-331 Adams Ave., Scranton 10, Pa.

Over 2,000 Bargains for SPORTS - FARM - HOME - WORKSHOP - INDUSTRY

U.S. GOV'T. SURPLUS "BARGAIN BOOK"

UP TO 85% SAVINGS ARE *Yours!*

Mail Today ONLY 10c

JUST OFF THE PRESS!

100,000 satisfied customers have discovered terrific savings on Clothing, Hardware, Sporting Goods. Nationally advertised brands. U. S. Government Surplus just released! Now available to you at less than ½ original cost. Send 10c. GET YOUR BARGAIN BOOK BY RETURN MAIL.

Fisler's 1329 MAIN Desk PS-2 KANSAS CITY, MO.

MOVIES

PRETTY MODELS-DANCING GIRLS

Movies that will brighten-up your home shows.

1. LADY BOUNTIFUL
2. BATTLE OF THE BULGES

8MM 50 ft (approx) $4.00
16MM 100 ft (approx) $7.00

GRAPHIC DEPT PS, 1165 BWAY., N.Y. 4, N.Y.

40 ACRE GOVERNMENT OIL LEASES—$100

You do no drilling, pay no taxes, may realize a king-size profit without ever leaving home. Free map and booklet. Write to

AMERICAN OIL SCOUTS, Dept. PS
7321 Beverly Blvd. Los Angeles 36, Calif.

Statement required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) Showing the Ownership, management and Circulation of Popular Science Monthly, published monthly at New York, N. Y., for October 1, 1953.

1. The names and addresses of the publisher, editor, managing editors and business manager are Publisher, Popular Science Publishing Co., Inc., 353 Fourth Avenue, New York 10, N. Y.; Editor, Volta Torrey, 353 Fourth Avenue, New York 10, N. Y.; Managing Editor, Howard Allaway, 353 Fourth Avenue, New York 10, N. Y.; Business Manager, Godfrey Hammond, 353 Fourth Avenue, New York 10, N. Y.

2. The owners are: Popular Science Publishing Company, Inc., 353 Fourth Avenue, New York 10, N. Y.; Stockholders of Popular Science Publishing Company, Inc.; Mansell and Company, 45 Wall St., New York 5, N. Y.; Noreen S. Capen, Capeswold, Bedford Village, N. Y.; Robert Cade Wilson, 683 Springfield Avenue, Summit, N. J.; Ada B. Wilson, 683 Springfield Avenue, Summit, N. J.; Marguerite N. Cole, Round Hill Road, Greenwich, Conn.; Irma V. Hammond, 1 Carstensen Rd., Scarsdale, N. Y.; Helen B. Glennon, 65 Prospect Ave., Larchmont, N. Y.

3. The known bondholders, mortgagees and other security holders, owning or holding 1 percent or more of the total amount of bonds, mortgages or other securities are: none.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

(Signed) Godfrey Hammond, Publisher

Sworn to and subscribed before me this 21st day of September, 1953. Esther Eyl, Notary Public, State of New York No. 24-6219000. Qualified in Kings County. Certificates filed with: New York and Kings Co. Clks & Register. Commission expires March 30, 1954. (Seal).

IDEAL LAWNMOWER SHARPENER

BOOST YOUR INCOME

You can earn cash with the Model 300 Ideal Lawnmower Sharpener. Used and recommended by leading manufacturers and service shops, the Ideal has everything you need, nothing else to buy. Grinds reel and bed knife, also reconditions. Get started now in this highly profitable business. Write for catalog today.

The FATE-ROOT HEATH Co.
Dept. PS-12, Plymouth, Ohio

MAGNETS 225 lb. PULL

GENUINE ALNICO—NEVER WEAKENS

AMAZING, PERMANENT MAGNETS—WILL NOT WEAKEN! NON-ELECTRIC
Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from sweepings. Clear alley of harmful tacks, nails. Many other uses. Pays for itself quickly. GUARANTEED. Try any magnet one week. Money refunded if you are not well pleased.

No. S-725 (Weighs 54 oz.) Has pull of 225 lbs. on steel block $15.00
No. S-675 (Weighs 49 oz.) Has pull of 175 lbs. on steel block $10.50
No. S-650 (Weighs 41 oz.) Has pull of 150 lbs. on steel block $ 8.50
No. S-500 (Weighs 15 oz.) Has pull of 50 lbs. on steel block $ 4.00
No. S- 30 Hobbyist assortment of six small magnets. . . . . $ 1.50

Send Money Order or check. We pay postage. No C.O.D.'s.

MIAMI MAGNET COMPANY, 3240 N.W. 27th Ave., Miami 42, Fla.

BARBELLS

100 POUND SET $9.80

Extra Plates Only 10c Pound

140-Pound, **CHROME DELUXE** Barbell-Dumbbell set only **$16.80.** This is our feature set and is the finest ever manufactured.

Training with adjustable weights is the **BEST** way to keep fit; the **ONLY** way to develop great strength and a perfect body. As the oldest and best equipped barbell company, BUR gives value and prices no one can — see!

SEND FOR FREE CATALOG.
BUR BARBELL CO.
Lyndhurst 5, New Jersey

MAGIC TRICKS

IT'S FUN TO DO MAGIC

Be popular! Amaze—mystify—entertain! For 30 years Douglas has satisfied customers all over the world. Now, you can enjoy this fascinating hobby. Only 10c brings our Catalog 500 Tricks, containing brand new tricks for pocket, parlor, stage. Join in the fun—send 10c today!

Douglas Magicland, Dept. P, Dallas, Texas

Do you work all day with

COLD FEET?

NOW, at last, a new, modern, low priced electric foot warmer that will keep you healthy, happy and comfortable

Help prevent colds with... **ELECTRO MAT**

Check stand cashiers, secretaries, assembly line workers, housewives, office workers, theatre cashiers, machine operators, telephone operators, and many others throughout the country are now singing the praises of the Electro Mat. There is no further need to work all day with cold feet. Many colds, causing absenteeism and irritability, can be directly traced to cold feet. *Safe and Economical*

Size 14" x 21" light-weight portable

Consumes less power than a 75 watt light bulb.

Mail your check or money order today for ONLY **$6.95**

F.O.B. Factory

PETERSON RUBBER MAT CO.
5508 N. Halifax Arcadia, California

Please send me ___ Electro Mats at $6.95 each
IMPORTANT SAVING
If 6 or more ordered, price is only $5.95 each.
☐ C.O.D. Enclose $1.00 deposit with order.
☐ Prepaid
Name_____
Address_____
City_____ State_____
PLEASE PRINT CLEARLY Dept. 100

SANTA'S HELPER

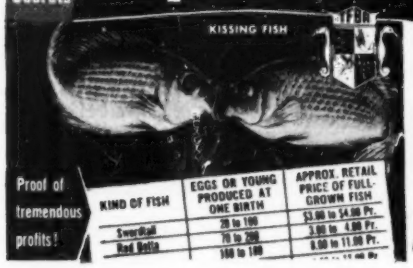
© The Borden Co.

• ELMER'S GLUE-ALL *dries clear.* It's ideal for sealing packages, making fancy gift boxes, paper ornaments, pasting window decorations . . . and mending broken toys the morning after.

ELMER'S GLUE-ALL
IF IT'S *Borden's* IT'S GOT TO BE GOOD!

Learn the Secrets

BREED RARE
tropical fish



Proof of tremendous profits!

KIND OF FISH	EGGS OR YOUNG PRODUCED AT ONE BIRTH	APPROX. RETAIL PRICE OF FULL-GROWN FISH
Swordtail	20 to 100	$3.00 to $4.00 Pr.
Red Bettia	70 to 200	3.00 to 4.00 Pr.
	150 to 100	8.00 to 11.00 Pr.

. . . IN YOUR HOME . . . SPARE ROOM, BASEMENT, GARAGE . . . ANYWHERE!

EARN BIG MONEY—SPARE TIME

New "Chance of Lifetime" opportunity! Start your own spare or full time business once you know the revealing breeding secrets. It's fascinating! It's Fun! Breed EXOTIC and graceful "Angel Fish", BEAUTIFUL "Gourami" that are 12 DIFFERENT COLORS, "Fighting Fish" THAT FIGHT UNTIL DEATH; "Danio" that are STRIPED LIKE A ZEBRA; TRANSPARENT FISH — hundreds of expensive varieties. Some fish lay 300 to 600 eggs at one time. (Some very rare fish have sold for over $75 a pair.) Get into PARTNERSHIP WITH NATURE and let nature multiply your profits for you. NO EXPENSIVE EQUIPMENT — NO EXPERIENCE NECESSARY. WE SUPPLY EVERYTHING YOU NEED. **HELP FILL HUGE DEMAND** from stores, offices, theaters, hotels, etc. New plan lets **YOUR MAILMAN BRING YOU ORDERS.** Investigate TODAY.

FREE! Colorful "How To Do It" success BOOKLET, REPRINTS, breeding BROCHURE and ALL DETAILS. Rush coupon today!

RUSH this Coupon TODAY!

Tropical Fish Breeders of America, Dept. C12
1010 S. Los Angeles St.,
Los Angeles 15, California

Dear Sir:
Please rush me all Free Details.

Name_____
Address_____
City_____
State_____
Your Age_____

start a big profit business with a small investment

EARN UP TO $200 a DAY

Manufacturing Exciting New

RAINBOW ROCK

Concrete Slump Brick in your back yard

Earn big building boom profits with Rainbow Rock, the colorful new building brick that's taking the country by storm. Sell all you can make to contractors, builders, building supply houses. RAINBOW ROCK CUTS LABOR COSTS BY 1/3! Amazing low cost machine makes modern slump brick 24" long (3 times the length of ordinary brick) in a variety of widths and pastel colors . . . up to 1500 bricks a day! NEEDS NO SPECIAL SKILL. Operates indoors or out. Full instructions and valuable mixing formulas supplied. YOU CAN START EARNING BIG MONEY NOW. PAY AS YOU PROFIT! A limited number of machines available on easy payment terms. NOW is the time to start. Write today for free literature and full information.

GENERAL ENGINES CO., INC.
Dept. SR-123 —307 Hunter Street
Gloucester, N.J. • Gloucester 6-1337

STEEL PIER SENSATION
Luxurious RAINBOW ROCK fireplace wall in living room of the "Home of the Century" in Atlantic City, N. J.'s Steel Pier . . . acclaimed by over 500,000 Summer, 1953 visitors as the most beautiful they'd ever seen! Endorsed by the Pier's famous architect, William F. B. Koelle.

Makes beautiful, decorative fences, garden walls, garages, outside walls, room separators, etc.

EARN $25 TO $75 A WEEK IN SPARE TIME

. . . No Selling To Do!

No Experience Necessary
Even a woman can operate it! We furnish complete directions for operating and getting business quickly, effortlessly.

With Guaranteed JETMATIC Venetian Blind Laundry

No risk, because you start your own business part time in your basement or garage. In a short time, when your profits exceed your job salary, you will make it your FULL-TIME business, as hundreds of others have done. Tremendous unfilled demand from homes, offices, factories, for this low-cost service. JETMATIC, made by world's largest manufacturer of perfect Venetian blind laundries, guarantees perfect results without taking blinds apart, without hand rubbing. WRITE TODAY for complete details and experiences of hundreds of men of all ages who are making more money with the JETMATIC.

L. C. ROBINSON MANUFACTURING CO.
522 North Rural St. DEPT. P-S Indianapolis 1, Ind.

PSORIASIS

PSORIASIS SUFFERERS: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for FREE important information. You needn't invest one cent!

PIXACOL CO., Dept. P, Box 3583, Cleveland 18, Ohio

NEW! EXCITING!

JET EXHAUST CUT-OUT

Now your car can sound off those exciting, dynamic tones—easily controlled mechanically from your dashboard. Channel your exhaust through special pipes or muffler without removing your original muffler. Easily installed. MONEY BACK GUARANTEE

- MADE OF HEAVY PLATE STEEL
- UNIVERSAL—FITS ALL EXHAUSTS

Send $1.95 (postpaid) check, cash, money order (add $1.00 for postage outside of U.S.A.) to:

FUR SALES, 1840 S. Michigan Ave., Chicago 16, Ill., Dept. PS
DEALER INQUIRIES INVITED

BUILD your own SMITH AIR COMPRESSOR

Operates spray guns, rock drills, tampers, paving breakers, sandblasting . . . Uses only 1 gallon of gas an hour! Save Money—build your own Smith Air Compressor! Famous the world over! Cap. 60 cu. ft.; pressure up to 100 lbs. per sq. inch. Just order the Smith Compressor Head and Accessories with complete instructions for assembling. All you need is a Ford Motor and shop facilities. Head equipped with high speed compressor valves; automatic unloading and idling.

Write for complete information!

GORDON SMITH & COMPANY, Inc.
405 College Street • Bowling Green, Ky.

spotlighting the CRIPPLER

Support . . .
TREATMENT
REHABILITATION
EDUCATION
RESEARCH

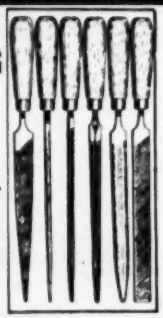
ARTHRITIS

Arthritis & Rheumatism Foundation

SWISS pattern

For Fine PRECISION Work — 999 uses

IMPORTED WARDING FILES
set of 6 with wood handles. 6" long
PRICE only $1.95
Postpaid



IMPORTED NEEDLE FILES
FOR HOBBYISTS, JEWELERS, WATCHMAKERS, DR'S. & DENTAL WORKERS
Set of 12 different shapes 7" long
PRICE $2.95
Postpaid

LIND SALES CO.
1521 S. La Cienega Blvd., P-S Los Angeles 35, Calif.
SEND CHECK OR MONEY ORDER

SENSATIONAL NEW LIGHTNING PORTABLE ADDING MACHINE

ADDS & SUBTRACTS

Amazing new adding machine skims through totals up to $99,999.99! Error proof. Subtracts too—in a jiffy! A must for all small businesses, students, anyone who works with figures. Does work of machines costing 10 times as much and more. Compact. Portable. Fits in drawer or brief case. Simple as dialing a phone! Handsome base. Precision made of finest materials. Over 300,000 in use! Full one-year guarantee! Amazing low price.

$14.95 ppd.

WILLOW SALES CO., 838 S. 6th St., Alhambra 2, Calif.

Classified Ads only 80c per word per insertion, payable in advance. Minimum ad 10 words. To be included in February issue, copy should be in our office by December 22. No cancellations accepted after December 15.

CLASSIFIED OPPORTUNITIES

POPULAR SCIENCE MONTHLY-351 FOURTH AVE.-NEW YORK CITY 10

GIFT Discount Buying 162 Page Catalog $1.00. Hone. 1500 Harvey Road. Wilmington, Delaware.

FLYING Flea Spin & stallproof airplane latest construction plans and instruction booklet $6.95. Free Details! Vemaline Co., Box 222. Hawthorne. New Jersey.

YOUTHS famous Ocean City Fishing Kit. Gift boxed $4.00. Bee Co., South Charleston 3. West Virginia.

THRILLING new Salon-style Home Hair Dryer. Only $13.95! Fully guaranteed! Details free. Consterdine Enterprises. 912 Virginia SE. Grand Rapids 6. Michigan.

STAMPS Wholesale: $3.00 Box. Limit 1. Brown's Coins & Stamps. 529 Southwest 29th. Oklahoma City 9. Oklahoma.

NATIONALLY advertised household appliances, watches. Up to 60% discount. Catalog $1.00. Reagan & Son. Box 731. Binghamton. New York.

WHOLESALE catalog. 450 items. Jewelry. Appliances. cameras. households. send 50c. Marsh. Box 5. Baldwin. N. Y.

FOOLPROOF Guaranteed AC Electric Shaver. Soothing action whisks away men's beards. women's surplus hairs. $3.95 Postpaid. with case. Two Siliconite Auto-Tool-Gun cloths—$1.25. Carlson's. 2523 Acqueduct. New York 68. N. Y.

BUY for Cash and save. Aluminumeare Jewelry Gifts Appliances Nationally advertised brands guaranteed. Write for free catalogue. Buttermilk Falls Exchange. P. O. Box 7C. Falls. Penna.

EVERYBODY'S Tying Flies! Christmas Kit contains good tools. illustrated instructions. authentic materials for 100 varied killers. Guaranteed to delight. Rush $6.00. Willmarth Tackle. Bayport 3. N. Y.

NEW student Model 120 Bass Italian Piano Accordions Complete case and straps. at wholesale prices only $159.00 plus C.O.D. shipping charges. Leonards Accordion Dist. 1736 West 63rd Street. Chicago. Illinois.

ALBINO hamsters. Free information. Circle S Hamstery. P.O. Box 183. Claymont. Delaware.

NO workshop complete without Easyplater. Also Electrochemistry sets. hobby items. Free catalogue. Easyplater. Box 293C. Red Lion. Pa.

SURPRISE Package. Really worthwhile. 25c. Hilltop Specialty Shop. Blackwood. New Jersey.

LEGS—Aching? Circulation Poor. Legs Relaxor gives quick relief $7.95. Write information. Legs Relaxor. 142 Brooks St.. New Orleans. La.

GIVE stamps to collector friends this Christmas. Quality assortments at $2.00. $5.00. $10.00. Guaranteed. Maximchuk. Flin Flon. Manitoba. Canada.

COMPLETE new library of 18 comic books. $1.00 postpaid. Sperry's. 1021 Oak. Elmira. New York.

BEST Quality Pearwood Recorder. Wonderful gift for young or old. "C" Soprano with instructions—$6.50 prepaid. Arthur Hersh. Box 24. Lakewood. New Jersey.

SENSATIONAL invisible Crystal Radio. Inside Headphone. Complete. ready to operate $3.00 prepaid. Bill Cotter. Washington 18. D. C.

DIFFERENT Beautiful. Redwood wreath greeting. postpaid December. $2.50 C.O.D. $2.00 cash. Empire Services. Santa Rosa. California.

AMATEUR Weatherman's Almanac. Shows how to study and forecast weather. Descriptions of instruments. Blank recording forms. Lists record storms. $1.00. Weatherwise. Franklin Institute. Philadelphia 3. Penna.

HOW To Live without money. (book). Write: H. Bishop. 405 Second St.. Neenah. Wisconsin.

100 ENVELOPES or Letterheads $1.00. Printing. 21 Barclay Ave.. Portsmouth. Va.

SPORTSMEN—Mail $1.00 for special Holiday offer — Fur-Fish-Game nine months $1.00 (save 80c) or one year $1.25. Fur-Fish-Game contains true. vivid stories on hunting fishing camping. travel. America's largest trappers monthly. Sample 3c. Clip advertisement. send at once with name. address. remittance to Fur-Fish-Game. 171 East Long St.. Columbus 15. Ohio.

"BRAND 17" America's most versatile 4x5 camera various interchangeable reducing backs other accessories available. Brand Camera Co.. 907 So. Victory. Burbank. Calif.

HATE Shaving? Incredible scientific discovery makes every shave a miracle. For guaranteed pleasurable lifetime treat send $1.00 for "Scientific Shaving". Institute of Functional Research. Box 4866. Washington 8. D. C.

HOME Bar Tips How to mix Zombies. Cocktails. Wines. When to stir. When to shake. Correct glassware. Book handsomely bound. Illustrated. handy size. Ideal gift. $1.00 postpaid. Advance Sales Co.. Box 24. Toronto. Ohio.

NEW Ideas and Items 25c Brings Samples to Retail for $1.00. Specialties. Box 475A. Park Ridge. Ill.

SONGWRITING Complete Course writing selling songs. $3.00. Northland. Box 1690-E. Milwaukee 1. Wisc.

INSTALL yourself. Save dollars. Automatic Thermostat for all hand fired furnaces. plugs into regular outlet. protects furnace. saves fuel. regulates room temperatures. Free literature. Linn Products. 516 Kercher. Miamisburg. Ohio.

ENGINE Pre-Heater. G-E. keeps idle motor warm. easy to start. even zero weather. Connects any electric outlet. Wonderful autoist gift. Chevrolet. Model regularly $9.95. special $4.45. Other cars (except Packard. Nash 600. Studebaker 6) only $3.95. Add 50c for postage. Wisniewski. Milwaukee 7. Wisconsin.

LOVELY $5.00 "Teens Bracelets" for $1.00. Jewell. Box 774. New Bern. N. C.

CHRISTMAS Special—500 Regular Envelopes Printed with name and address. only $2.95. Free Samples. James Ferrario Printing. 728 South Webster Avenue. Scranton 5. Pa.

XMAS special free ball pen. 100 double edge razor blades $1.00. Payne. 5426 5th Avenue. Los Angeles 43. Calif.

SHIP Models Ltd. Kits. Fittings. Plans. Stuart-Turner Steam Engine Castings. 1953 Catalog 25c. Box 751. Brookline 47. Mass.

A "Suitcase" full of Cartoon Fun. Your children can learn cartoon drawing in a jiffy. Complete set $1.00. Additional Funny Face cards 50c. Selumart. Box 29. New York 72. N. Y.

PRINTED stationery $1.25 per box. Aneralla. 1423 Edwards. New York 61. N.Y.

NATIONALLY advertised Stamp Albums. U.S. Price List. Packets. Supplies—Lists free! Cole. 43-G Rinewalt. Buffalo 21. N.Y.

GOLD! Personalize signatures on Christmas Cards and snapshots with brilliant gold metallic ink. $1.00 bottle. Metalux. Box 17. Bay Station. Brooklyn 35. N. Y.

"MICKEY Rooney One Man Band" Seven In One Comedy entertainment novelty. Ideal gift all ages. $3.95 postpaid. Virillo. Box 507. North Hollywood. Calif.

$1.-IN envelope brings 20 Wh. Mountain minerals mounted in giftbox. Analysis included. Ramblin' Ranch. Campton. N. H.

UNUSUAL Christmas gifts. photographic enlargements beautifully mounted. 3-5x7 or 2-8x10—$1.00. Klein. 980 Simpson St.. New York 59.

BARGAINS Wonderful books; courses on drawing. painting. cartooning. lettering. Free Catalog. Art Book Shop. Arnold 5. Missouri.

VACRACK solves tank vacuum cleaner storage problems. Vacrack Products. Box 2435. Cleveland 12. Ohio.

FREE! 60 Wholesale Catalogs Free! Sherry's. Box 11-S. Miami 37. Florida.

SIDEWALK Engineer? Give him "How to Operate Excavation Equipment." 144 pages. illustrated. absorbing authentic. Cloth $2.50. paper $1.50. C.O.D. extra. North Castle Books. Greenwich 1. Conn.

100 PHOTOSTAMPS—$1.25. Buy Wholesale: catalog. 50c. (refunded). Inquiries invited. Johnson. 1129 State. Harrisburg 33. Pennsylvania.

INKLESS Fingerprint Outfit Postpaid $1.00. Identprint. Box 137. West Haven. Conn.

CARVALET. Perfect Traveler's gift. Hangs Clothes neatly across rear seat $1.00 postpaid. 1578 Brooks. Fresno. California.

BEAUTIFUL Swiss Musicboxes at $5. Schär. Allschwilerstr. 123. Basel. Switzerland.

QUBIC. discover the great 3-D plastic game. Guaranteed for exciting fun or return for refund. Postpaid $2.50. Qubic. 54B Warner St.. Springfield 8. Mass.

HERE'S a new toaster. Features automatic operation. shade control. air cooled system. butter cup. plastic cover. year guarantee. only $22.95 ppd. Rudolph Nibbs. Box 12-S. St. Thomas. V.I.

1 AUTOMOBILES & MIDGET CARS

HI-Mileage-Speed equipment from the world's largest supplier. Dual manifolds. finned heads. electric doors. lowering sets. chrome panels. thousands of items for all cars. 1954 catalog 25c (illustrated literature free). Wholesale to garages. Newhouse Automotive Industries. Los Angeles 22.

COLOR Slides—35mm. Sports. Classic. Custom cars. 3 for $1.00. List. sample. 50c. Autoslides. Box 24. Eastwood Station. Syracuse 6. New York.

OLDE Tyme European Autos. Actual 5x7 photographs of European olde tymers with technical data. $3.00 dozen. Actual 5x7 photographs of American olde tymers $3.00 dozen. Both sets $5.00. Ozark Enterprizes. P. O. Box 102. Rolla. Mo.

FIBERGLAS automobile bodies. Build your own. Gem-O'-Lite's own "How" book —$2.50. Information. materials Catalog—10c. Airmailed—35c. Gem-O'-Lite. Box 6868A. North Hollywood. California.

ALL-Car Auto Club offers automobile literature—old. new and foreign; dealer books; service manuals; glossy photographs; free motor magazines. Write today; get on Free mailing list. Auto Maniacs. Inc.. Stockbridge. Michigan.

CROSLEY owners. Merry Christmas from the Crosley Car Owner's Club. 2101 Greenway. Charlotte. North Carolina. Write for details.

PHOTOGRAPHS World's Finest Automobiles. List. Sample. 25c. Box 1028. Minneapolis. Minnesota.

A Better Car For You! New 256-page book "How to Take Care of Your Car" by famed Popular Science experts shows you easy ways to beat high cost of car care repair. Over 750 pictures. hundreds of easy instructions on fixing. servicing. saving on gas. more! Guaranteed! Only $2.49. Popular Science. Dept. 1253C. 353 Fourth Avenue. New York 10. New York.

POPULAR SCIENCE OPPORTUNITIES

ANTIQUE-Classic-Custom-Sports Cars. Buy, sell, swap. "A.T.S." lists hundreds twice monthly. Sample 15c. Automotive Trading Service, Box 1188, Akron 9, Ohio.

2 AUTO SUPPLIES & EQUIPMENT

NEW and used guaranteed parts for civilian and Army cars and trucks. Largest stock in America. Mail orders. Pioneer Auto & Truck Parts Company, 788 W. 13th Avenue, Denver, Colorado.

BRUSH Plating Outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Ave. K, Decatur, Illinois.

SECOND Edition. It's New! It's Different! Get world's largest Auto Accessory & Parts Catalog and save money. 132 pages. Over 50,000 items, including Hollywood Accessories Hi-Speed Equipment, Rebuilt Engines, all parts and accessories for all cars and trucks. We have that Hard-To-Get part! Jam packed with bargains. Completely illustrated. Send 25c (refundable). J. C. Whitney, 1919-KB Archer, Chicago 16.

SAVE—California Custom Accessories headquarters. Buy direct from original designers. Electric push button door-trunk conversions, Bull Noses, Custom Grilles, Speed-Dress-Up Equipment. 40 page catalog, hundreds of photos. Send 25c to Eastern Auto, 3319B South Grand, Los Angeles 7, Calif.

GM71 Discarded injector parts wanted. Hogen, 7120 Carnegie, Cleveland, Ohio.

"MODEL T" Ford Parts—engine and chassis. Parts for other makes old models, too. Special parts made to order. (We also buy surplus items). B. S. Wisniewski Inc., Milwaukee 7, Wisconsin.

"WATER Injection." Free descriptive illustrated information. Neher Industries, LaVerne 6, California.

BRAKE Checker. Be safe. Safety check your brakes before the police do. Simple, easy, and clean to use. No experience required. $1.00. Block Tester Company, Box 1238, Brawley, California.

CARBURETOR Flanges for vacuum controlled valve oilers, water injectors, vacuum gauges, etc. Send $1, make and model car. Flanges, 253-E Angeleno, Burbank, Calif.

BUY Wholesale nationally advertised auto supplies, thousands other products at big discount. Free "Wholesale Plan." American Buyers', 629-E Linden, Buffalo 16, N. Y.

LEAVE 'em Behind With Du-L-Spark. Dual Point Adapter Plates, Ford $1.50, Chev. $2.00. Free Catalog. Hove, 1503 Hennepin Avenue, Minneapolis 3, Minn.

CAR Insurance only $1.00; guaranteed lubrication if equipped with Pro-Caps one minute installation, set of 25 only $1.00 postpaid. A. Creed, 123PS Warner Bldg., Washington 4, D. C.

BARGAIN Offer! Surplus stock of Gale Hall's original Gasoline Economy and Motor Condition gauges, designed for permanent dashboard mounting. Brand new, original cartons! Directions and connections included. Original price $7.50, now only $3.98 plus 40c postage! Deluxe all-chrome model, originally $12.95, now only $5.98 plus 40c postage! Order now! N. E. Surplus Sales, Dept. PS-12, 67 High Street, Newburyport, Mass.

INCREASE! Gasoline mileage Three to Five more miles per gallon. Guaranteed Gasoline Vaporizer, also Increases Power, Easier starting. $3.50. Turb-O-Vane, Stockton, Calif.

LACHAPELLE'S Treatment. (Patented.) Puts babbitt bearings in the motor for the pistons to slide on. At your dealer $3.00 or postpaid. Ferns Products, 8120-D Walnut Dr., Los Angeles 1, Calif. In Canada, Master, Box 3, Station C, Hamilton, Ontario. Data on request.

SILVER Alloy Ignition Points. Best contacts known. Smooth speed power. Custom made. Write Scientific Electric, Box 2162PK, Cleveland 8, Ohio.

ELECTROPLATE autoparts, novelties, mirrors. Easy, inexpensive home processes. Free booklet. Tyco Metals, Box 13231-FC, Houston 19, Texas.

FORD, Chevrolet, Plymouth, Genuine Tungsten Super Points $1.00 Super Condenser Free With Points Unconditionally Guaranteed. Hove, 1503 Hennepin, Minneapolis 3, Minn.

ATTENTION Motorists—You can save time and money by Polishing and Waxing your car in one Easy Operation with Easy Glitter car wax, ½ lb. can $2.00 postpaid. Kasten Chevrolet Co., Altenburg, Missouri.

GET More Power and pick-up with La Mondia's improved non-fouling Ever-Kleen Spark Plugs, easier starting, more miles per gallon. Great for two cycle engines 10-14-18mm. sizes. Price two dollars each. Address EverKleen, 212 E. Castle St., Syracuse 5, New York or Charles Thomas, Route #3, Rome, New York.

PROFESSIONAL Automotive Gauges—surplus stock of Famous Gale Hall instruments, brand new, original cartons! Compression gauges, originally $10.75, only $2.98 plus 40c postage! Precision engine analysis vacuum gauges, originally $12.50, now only $4.58 plus 40c postage! Catalog of other bargains sent free with first order! N. E. Surplus Sales, Dept. PSA-12, 67 High Street, Newburyport, Mass.

CAR burning oil? Losing compression? Try Clifford's Compression Seal. $2 Postpaid. Clifford's, 1329 Seventh, Aurora, Ill.

SAVE your automobile battery. Samac, containing Cerium will revitalize any mechanically sound battery. Guaranteed to extend life. Standard package $2.00 postpaid. C.O.D. plus postage. Chemicals Division, Canion Industries, Inc., P. O. Box 181, Kensington, Maryland.

MOTORIST Save Gasoline Vacumating overrich mixtures. For Free particulars, how you install on your car for introducing, write Vacumatic, Dept. 2052, Wauwatosa, Wisconsin. Salesmen Wanted.

CONVERTIBLE Tops—A good X-mas Present—Custom Made Black-Tan, $27.95: Florida Top Shop, 7325S Old St. Augustine Rd., Jacksonville, Florida.

WIPING Cloths 2½ lbs. for $1.00. Fahrman, 343 Hamilton, Allentown, Pa.

SMALL German built toggle switches, 3 position, ebony handle. Hole mounting. Superb quality. 2 for $1.95. Competition Chemicals, Box 141, Iowa Falls, Iowa.

CHEVROLET Owners: Stop tappet noise with Kaye Tappet Silencers. Quality product. Easy to install. Complete set $5.95. Kaye Products, 2067C So. Layton Blvd., Milwaukee, Wisconsin.

KUICK whitewall tire cleaner, fast, economical, money back guarantee, 14 oz. can $1.25, postpaid. Kuick Chemicals, Manufacturing Chemists, 1762 Main Street, Buffalo 8, New York.

BUY Wholesale! Join The Discount Club. Lifetime membership $1.00. Free information. Box 622A, Burbank, California.

NEW life for worn out batteries termed "dead." 50c package. Power-X, P.O. Box 55, Staten Island 10, New York.

SAVE your life with amazing new "Torsion-Flex" Sway-Blilzers! Stops sway, skid, slide. Postal brings free illustrated literature, gift offer. Sway-Blilzer, 5434-B Higgins Road, Chicago 30.

"BIG Discounts"—Speed, Power Custom Equipment! Catalog 25c (Information Free). Almquist Engineering, Milford 6Z, Pennsylvania.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

3 AUTO TRAILERS

BUILD your own trailer! Plans for all kinds. Illustrated catalog 10c. Jim Dandy, 125-S, Wausau, Wisconsin.

AVAILABLE in Kits. Slip-on Coach for all Pickups. Trailer Kits. Trailer blueprints. Catalog 10c. Comstock Trailers, 565-SK, Parsons, Kansas.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

RECONDITIONED motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 27, Mo.

CZEK motorcycle $25; Midget motorcycle $29; Doodlebug motorscooter $30; Whizzer bike motor $10; two cylinder Maytag engine $4. Four airplane tires $3. Mailorder only. Send 25c for catalogue Number 56, just out, listing these and hundreds of other bargains in new and used midget cars, motorscooters, home-builders parts, plans, etc. (35c by first class mail). Midget Motors Directory, Athens, Ohio.

MOTORBIKES, power mowers, engines, sprayers. Free Catalog. Lenco, Box 436, Danville, Illinois.

NEW Wasp 4 Cycle Bicycle Engine Kits. Ready to install on bike. Cauffiel Motor Industries, Temperance, Michigan.

5 AVIATION

PROPELLERS, plans, for snow sleighs, airboats. Literature. Gano Propeller, Box 3284B, Ft. Worth, Texas.

PROPELLERS—Pusher propellers for sleds and boats. CallAir, Afton, Wyoming.

PROPELLERS, Plans, Supplies, for snow sleighs, air boats. Immediate delivery. Catalog 25c. Banks-Maxwell, Box 3301G, Ft. Worth, Texas.

6 BATTERIES, GENERATORS, ETC.

EDISON Nickel odorless storage batteries, 12 to 600 ampere hour. Any voltage. Long guarantee. Literature. Hawley Smith Co., Croton Falls 2, New York.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTRIC Pencil: Engraves all Metals, $1.50. Beyer Mfg., 10511-C Springfield, Chicago 43.

LAMPS—25c brings bargain catalog showing all parts for repairing, building. Contains instructions for electrifying vases, oil lamps, etc. Gyro Lamps, 5402B Clark, Chicago 40.

REVERSING Switch. Free trial, free literature, no money with order, no COD, maximum motor ¾ HP. After ten days, send $2.98 or return switch. Best Tools Inc., Dept. 83, Box 92, Berwyn, Illinois.

FREE Catalog. Surplus and other merchandise. Hydraulics, Generators, Welders, Motors, Boat Kits, Winches, Tools, Pumps, 1500 items. Dunbar Mfg., 10318-C Aurora, Seattle, Washington.

LAMP Supplies—Wholesale—any amounts. All parts for repairing and building lamps. Catalogue 15c. Brown Specialties Co., No. 501—Wellston Sta., St. Louis 12.

FREE Surplus Catalog. You need it, we have it. Everything in Hydraulics, Pumps, Winches, Welders and supplies. Mechanical books. Prices you can afford. LeJay 23, Minneapolis, Minnesota.

8 WELDING, SOLDERING

WELDERS — electric — various models, $28.50 to $235.00 direct from manufacturer. Free literature. Champion Welder Mfg., 193PS Centre St., New York 13, N. Y.

WELDERS make ornamental iron railings, illustrated manual $1.00. Joseph O'Connor, Milan, Ohio.

"BUILD-Ur-Own" a.c. welder and a.c. power plant with a good used engine and low cost Hobart generator. Weld anywhere and supplies 5KW stand-by power for any emergency. Write Hobartweld, Box P-1233, Troy, Ohio.

A.C. Welders. Four Sizes. Lowest Prices. Free Literature. Holgerson's Serv., Canton, Kan.

WELDERS "Instant Start" 100v. $29.50. Morris, 1070 In er Drive, Schenectady, New York.

9 MACHINERY, TOOL SUPPLIES, ETC.

TOOLCHESTS wood complete $64.—Foster's, 244 West 106 Street, New York 25.

POPULAR SCIENCE OPPORTUNITIES

MOTOR driven rotary Hone sharpens all Keen Edge tools. A must for all shops. Immediate delivery. Moore Industries. Fredonia, Pennsylvania.

ALLEN One Ton Power Bench Type Punch Press. $125.00. Circular. Allen. Dept. PSB, Clinton, Missouri.

LEVEL any kind of construction, grading without a transit. Simple one-man precision instrument. Costs only $12.95. Write for Free Booklet, Levelall, 85N Park St., Rockland, Mass.

BUILD Your own machine tools. Milling machine castings only $49.50. 10" shaper $97.50. Twenty others at low prices. Catalogue 10c. Lewis Machine Tool Co., Los Nietos, California.

TOOL post turns thousands of different size concave, convex radii 0" to 4" no special tools to grind. Radius Tool, Box 476, St. Louis 12, Mo.

POWER tools, equipment wholesale prices. Free bulletin. Homecrafters Cooperative, Grand Rapids 6, Michigan.

10 ENGINES, MOTORS, ETC.

WINDING Data, listing 225 motors single and three phase $1.00. Motor Data, Box 7631, Kansas City 28, Mo.

ALTERNATING Current Generators 750 Watt $38.50. 5000 $185. Motors ¼ horse $15. ¾ $22. 1 $35. Butler, 1885 Milwaukee, Chicago 47.

REBUILT Gasoline Engines, $17.00 to $37.00. Cauffiel Motor Industries, Temperance, Michigan.

11 BOATS, OUTBOARD MOTORS

BUILD marine engines with Federal Conversion Kits. Federal Marine Motors, 9011 Cottage Grove Ave., Chicago 19, Ill.

NEW, used rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

OUTBOARD Motor Parts—New—Used for all makes. Send stamp for price quotation listing parts needed. Outboard Motor Mart, Inc., 229D State Street, Boston, Massachusetts.

FULL size, cut-to-shape Boat Patterns. Blueprints. 7½-38 feet. New 1954 illustrated "Build A Boat" catalog of 50 naval architect-designed Cruisers, Runabouts, Sloops, Skiffs, Outboard Boats, Sailing, Racing, Houseboats, 25c. Marine Hardware Catalog $1.00. "How to Build Boats" book, $1.75. Polywog Houseboat Plans, $12. Cleveland Boat Blueprint Co., Dept. A-77, 9400 Steinway, Cleveland 4, Ohio.

BUY Wholesale nationally advertised cutboards, thousands other products at big discount. Free "Wholesale Plan." American Buyers', 628-E Linden, Buffalo 16, N. Y.

MARINE Conversions—Willys to Cadillac. Catalogue and conversion hints free. Barr Marine Products, 2709B Castor Avenue, Philadelphia 34, Pa.

BOAT Kit, complete, only $59.00. Semi-Vee, 12', light enough for cartop. Pre-assembled frames, pre-cut parts, brass screws, illustrated instructions. Write for literature. Penney Woodcraft Industries, Dept. C-17, Defiance, Ohio.

CRACKER Box Boat Plans $7.50 set. Marine hardware at discounts. Literature free. Glen Marine, Box 568, Compton, Calif.

BRITISH Anzani Super Outboards, ¾ to 15 horsepower, literature free. Damac Corporation, Roslyn 13, New York.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N. J.

"BELLY Tanks" $9.95. Free picture. Buckman Co., 89A Merced, California.

FIBERGLAS permanent boat coating. Gem-O'-Lite's own "How" book—$2.50. Complete catalog—10c. Airmailed—35c. Gem-O'-Lite, Box 6868B, North Hollywood, California.

BOAT Kits, Sail, Power, Oak Construction. Hardware. Catalog 15c. Boatbuilders Marine, 55-P Sorrento, Allston, Mass.

FIBERGLAS—Lifetime boat covering. Patch kit covers 11 sq. feet $5.00 postpaid. Free information. Northwest Fiber-Glass Co., 1531 North Morgan, Minneapolis 11, Minnesota.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

HANDBALANCING self-taught. Complete illustrated instruction. Money-back guarantee $2.00 postpaid. W. Power, 923 W. Vine, Kalamazoo, Michigan.

BREATHING exercises develops chest, good looks, good health. "Breath of Life" booklet gives seven detailed exercises. $2.00. Ray, Box 873, Columbus 4, Ohio.

SKINNY? Fastest weight gaining system $1.00. Luzzi, 29 Hall Avenue, Tuckahoe 7, New York.

14 FIELD GLASSES, TELESCOPES

WAR Surplus Bargains. Binoculars, Telescopes, Sextants. Millions of Lenses, Prisms, Reticles, Eyepieces, Objectives, etc. Mail 10c for Big "Catalog CN." Send $1.00 for Stock CN-10-piece Lens Kit and Big Instruction Booklet. Edmund Scientific Corp., Barrington, New Jersey.

GIANT 100X to 400X telescopes easily made. Complete kits from $2.00 up. Free money saving price list. Suffolk Science Service, Riverhead, New York.

FREE Catalogue! Thousands war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 691 West Merrick Road, Lynbrook, New York.

SAVE Money—Get interesting facts. Free 52 page three color catalog. 80 different models. United Binoculars, 9043 S. Western, A-7616, Chicago 20.

AMAZING prices, binoculars, telescopes, microscopes. Free trial. Folder. "Binocular Selecting" optical catalog free. Prentiss Importers, Mercury Bldg., West Los Angeles 25, California.

SPECIALISTS. Used new microscopes. Prepared slides. Supplies. Telescopes. Free illustrated catalog. Nassau Optical, 9 W. Greenwich, Roosevelt, New York.

REFLECTOR Telescope Kits from $6.25. All parts designed and built at our Hoboken factory. Mirror Cells, Diagonals, Focusing Mounts, Tri-Pods, Tubing, Oculars. Fully Guaranteed. Send for Free Illustrated Catalog. Our only Sales Showroom. Esco Products, 134 West 32nd St., Rm. 204-B, New York 1.

BINOCULARS—Telescopes, Microscopes. Terrific values $3.98 up. Request Free-Money saving catalog. Criterion, Hartford, Conn. Dept. S16.

BINOCULAR specialists, all makes repaired. Authorized Zeiss, Hensoldt dealer, Tele-Optics, 5514 Lawrence, Chicago 30, Illinois.

AMAZING High Power Telescope Kit Including Tubing, Fittings, 5 ground, polished Lenses, Instructions $2.95 postpaid. Brings objects 21 times closer! Hobbycraft, 7111 Princeton, Chicago 21.

REFLECTING Telescopes, completely assembled, 60X, $29.75. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

TELESCOPE Kits—Accessories. Mirrors aluminized, ground to order. Free catalog. Garth Optical, 130 Garth Rd., Scarsdale 3, New York.

GIANT 100 power day and night telescope. Completely assembled. Steel and brass tubing construction. Hardwood tripod. Same size and quality lenses as $15.00 telescopes. Only $7.95 fob factory. Carl Jamer, Manorville 5, N. Y.

GIANT Astronomical telescope complete with 6 ft. tripod, 45X, 75X, 100X eyepieces. Sun Projector lens. $15.00. Money back guarantee. Suffolk Science Service, Riverhead 3, New York.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

BINOCULARS. Lowest prices. 8x30, $32.00 guaranteed. Telescopes, microscopes. Free catalog: All sizes. Joe's Binocular Sales, 4827 Second Blvd., Detroit 1, Mich.

STAR-Atlases, astronomical books. Write for list. Herbert A. Luft, 42-10 82nd Street, Elmhurst 73, New York.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

120 PROFUSELY illustrated pages antique pistols, swords, daggers, armor, etc. 50c. Robert Abels, PS860 Lexington Ave., New York 21.

FREE Catalog: Flies, Lures, Mustad Hooks, Fly Tying, Lures, Spinner, Rod Making Materials, Nylon Coils. Supreme Mfg. Company, Amarillo, Texas.

BUY Wholesale nationally advertised sporting goods, thousands other products at big discount. Free "Wholesale Plan." American Buyers' 627-E, Linden, Buffalo 16, N. Y.

IMPORTED Stilettos, Daggers, Springers, Throwing knives, Hunting knives, etc. Free Catalog. J. D. Clinton, 94 Church Street, Mt. Clemens 3, Michigan.

5,000 BARGAINS. Firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

CAST Iron Sinker Molds—for making your own sinkers. Free illustrated booklet. Reading Instrument Co., Box 78, Reading, Pennsylvania.

SAVE 50% on finest Bows, Arrows. Complete Bowhunting outfits, etc. Free catalog and "How To Select Archery Equipment" booklet. Malibu Archery, 3156-BD West Eighth, Los Angeles 5, Calif.

MOLDS for Fisherman's Sinkers, Jigs, Squids. Casting and Spinning Lures. Swee.'s Molds, Tonawanda 3, New York.

GUNS!!! Guns!!! Guns!!! Mausers, Luger, Kentuckies, New-used Hunting Bargains. Antique Arms—Illustrated Catalog 50c. Ed Agramonte, Yonkers 2a, N. Y.

STOP Back lash. Enjoy fishing. Free details. Write Deagle, 238-D Jackson Street, Twin Falls, Idaho.

JAP rifles altering American shells $6.00, catalog 5c. TP Shop, West Branch 10, Michigan.

POWERFUL Blowgun. Complete with darts. $1.98. Ray's, 6631 Ashbury, Affton, Missouri.

OVER 500 guns, modern, obsolete. List 10c coin. Ed Howe, 26 Main, Coopers Mills, Maine.

FISHERMEN. Make your own custom Bamboo Rods. Choice tonkin cane kits. Lowest prices. Casting, Spinning, fly rods. Send for free complete list. Paul H. Young Co., 8065 Grand River, Detroit 4, Michigan.

16 CAMPING EQUIPMENT & TENTS

CAMPING equipment. Sleeping bags, Tents. Low Prices. Free 80 page catalogue. Mor-San Sales, 10-21-G 50th Avenue, Long Island City 1, New York.

17 DOGS, BIRDS, HAMSTERS, RABBITS & PETS

MAKE Big Money! Raise Chinchilla Rabbits. Cash Markets Supplied. Write Today! Rockhill Ranch, Sellersville 16, Pa.

RAISE Mink: Free booklet, pen plans, inside "secrets," feed, care. Mink are money makers. Investigate today. Lawrence Molgard, Brigham City 13, Utah.

RAISE Highly-Profitable Angora and New Zealand rabbits. Particulars free. White's Rabbitry, Jackson, Michigan.

HAMSTERS—Golden; young $3.00 pair; fully developed, $4.00 pair. Request prices on rare albinos. Adirondack Hamstery, Prospect 9, New York.

CHINCHILLAS for profit. Best prices. Herb Miller, 1911-N, Lubbock, Texas.

HAMSTERS — Cages and Equipment. Write for Information. Circle S Hamstery, P. O. Box 183, Claymont, Delaware.

HAMSTERS—Golden and Albino. Fine Christmas gifts. Free information. Anderson's Hamstery, 35 Oneida, Pontiac, Michigan, Dept. 20.

POPULAR SCIENCE OPPORTUNITIES

GUINEA Pigs. Home business. Booklet free. Taylors. B426B. Hapeville. Georgia.

RAISE Fishworms—Highly profitable! Illustrated booklet explains raising, feeding, marketing, shipping. 25c. Ozark Worm Farm-V. Willow Springs. Missouri.

NATURALIST'S Catalog 10c. Lizard 75c. Hamsters $4.75 trio. 200 Mealworms $1.20. Quivira Specialties. Topeka 10. Kansas.

HAMSTERS Golden and Panda. literature Free. Charles E. Bowser. Smokerun. Penna. Dept. P.

SALE Tame Red Striped Squirrels. Dewey H. Balch. Castleton. Vermont.

CHINCHILLAS (no rabbit) easily raised. Profitable. Big future. Terms. Cliff's Chinchillas. Ithaca. Michigan.

CHINCHILLAS Rented. Offspring bought. R Rau Route 2. Jeannette 4. Pennsylvania.

RAISE talking parakeets, choice breeders. Adie. 481 Ferndale Avenue. Youngstown. Ohio.

LIVE Baby Alligators $3.50 each postpaid with instructions. Length 10" to 14". Live delivery guaranteed in U.S.A. Jackson Trading Co. P.O. Box 817. Dept. A. Miami Beach 39. Florida.

19 FARMS, OTHER REAL ESTATE

FARM-Ranch Opportunities. Favorable conditions. Washington. Minnesota. Montana. Idaho. Oregon. North Dakota. Literature, farm descriptions. Specify which state. J. W. Haw. 120 Northern Pacific Ry., St. Paul 1. Minn.

CALIFORNIA Ranch Lands. 50c to $5 acre minimum bid. Farm-ranch-hunt-fish-retire. 10c brings illustrated land catalog, outline maps. Tax Land Sales, Box 2350BX. Hollywood 28. Calif.

FLORIDA—New development adjoining Ocala National Forest in Lake County. Best fishing, hunting. Nice homesites $245 at $10 monthly. Folder free. Winfree Vernor DeLand. Florida.

STROUT'S Farm Catalog. Farms, Homes, Businesses. 33 States. Coast-to-Coast. 3298 bargains described. Mailed free. World's largest. 53 years Service. Strout Realty. 255-ZB 4th Ave., New York 10. N. Y.

FLORIDA Beautiful Retirement Homesites, near Gulf Coast. $250 at $10 Monthly. Finest Fishing, Hunting. Government Game Preserve nearby. Free Literature. A. M. Mathews. Owner. Box 1406. Asheville. North Carolina.

FLORIDA. Central. Lake-Front subdivision near Tavares, lots 10% down, $25.00 month. Write John D. Rapalje. Box 792A. Tavares. Florida.

FLORIDA'S choicest lakefront lots. Excellent fishing—hunting. Eustis-Deland highway. $10 monthly without interest. Free literature. Roepke's. Eustis. Florida.

SELLING village homes like rent. Request list. Perry. Brier Hill 29. Pa.

FLORIDA—Homesites, business sites and acreage in Potterfields Garden Acres. High dry land about 40 miles from Tampa and St. Petersburg close to wonderful Hunting and Fishing. Tracts as low as $595.00 for three acres, only $10.00 down, $10.00 month. Information write G. B. Potterfield. Owner. Dept. V. Charleston. West Virginia.

20 TREES, SHRUBS, ROOTS, HERBS

FRUIT Trees! Stark Bro's sensational new "Dwarfs." Also standard size exclusive patented, trade-marked varieties produce abundant, larger, better apples, peaches, pears. All fruit faster growing, quicker bearing. Also beautiful ornamental trees and shrubs. Get giant new Color-photo Catalog Free. Stark Bro's., Dept. 30064. Louisiana. Missouri.

DECEMBER offer 150 fresh double petunia seed mixed or separate colors $1.00. Natson's. Blooming Prairie. Minnesota.

21 POULTRY & SUPPLIES

RAISE pheasants on $100 week plan. Little capital and space can make you independent. Free details. Great Central System. Columbus 6. Kansas.

POULTRY Farmers—Broiler Growers—Turkey Raisers read the new American Poultry Journal for latest ideas and greater profits. 12 months, 50c. Special offer, 4 years, $1.00. American Poultry Journal. 182 North Wabash. Chicago.

RAISE Turkeys the new way. Write for free information explaining how to make up to $3,000 in your own backyard. Address—National Turkey Institute. Dept. 57. Columbus. Kansas.

22 PROFITABLE OCCUPATIONS

"HOW to Make Money With Home Workshop" describes amazing methods used by hundreds of successful craftsmen. Tells what to make. How to sell workshop output spare time. Write at once for details. Craftsman. 115B12 Worth St., NYC.

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write Wagoner. P-125 W. 86th. N. Y. 24.

WANT A Diesel Job? New Opportunities to increase income. Higher Pay. More Money. We can help you Qualify. Tools. Shop method home training. Write today! Diesel Tractor Heavy Equipment Division. Interstate Training Service. Dept. B2-N. Portland 13. Oregon.

$10,800 PROFITS! Your Own Mailorder Business! No Risk! "Success Plan" Free! Treasury. 709 Webster. New Rochelle P-18. New York.

FOREIGN Employment Construction Work. If interested in foreign projects with high pay, write Foreign Service Bureau. (Dept. P.S.). Metuchen. New Jersey.

ADDRESS advertising postcards. Must have good handwriting. Lindo. Watertown. Mass.

EVERY Home Can Use 6 Hot Air Register Filters. No Soot On Walls. Costs $.60. Sells $1.00. Send $1.00 For Sample. Modern Metal Products. Warren. Ohio.

BUY Wholesale thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers. 623-S Linden. Buffalo. New York.

FREE! "301 Profitable Small Businesses!" Amazing shoestring plans! Work Home! Start Sparetime! Deumant Surveys. Kenmore 23-T. New York.

$40.00 WEEKLY. Make growing mushrooms. Dominion Patent 331,583. Free spawn with Order. North American. 169Y Yonge. Toronto. Canada.

LUCRATIVE profession. Repair china antiques invisibly. Complete course $5.00. Gussack. 12310 Magnolia Blvd., N. Hollywood. Calif.

MUSHROOMS grown boxes, barrels. Manureless process 50c. Spawn $1.00. Gardens. 552 William. Winnipeg. Manitoba.

GROW Mushrooms. Cellar, shed, and outdoors. Spare full time, year round. We pay $3.50 Lb. We paid Babbitt $4.165 in few weeks. Free Book. Washington Mushroom Ind., Dept. 101, 2954 Admiral Way. Seattle. Wash.

WELDING Pays $$$. Learn easily at best equipped school in country. Non-profit School with low cost training. G.I. approved. Write Hobart Trade School. Box P-1232. Troy. Ohio.

BUY Wholesale thousands nationally advertised products. Save money! Make money! Postcard brings details. Kemah Company. 5017-D Washington. Houston. Texas.

HOME Mail Order Beginners. Sources, methods, instructions. Details plus opportunity offers. 10c. Carnahan Bros., 5582-B Nelson. Cypress. Calif.

DRAFTING. learn at home in spare time. It's easy with C.E.I. individual tutor method. Write for Free success book. Cleveland Engineering Institute. 6301 Euclid. Cleveland 3. Ohio.

BIG Kit. Make lovely gifts from beautiful colored shells. Pins, earrings, talley cards. Earn extra money. $3.25 complete. Catalog 10c. Duryea Shell Studio. Bay Pines. Florida.

MAKE money raising Chinchillas. The coming fur! Easy to raise in basement or backyard. Feed $4 year. Registered breeders for sale. Free literature. Felker. R-3. Box 630. Golden. Colorado.

HURRY! Cash in on coming income tax boom. Learn how to prepare tax returns. Experience unnecessary. Write Union Institute. Lakewood 1-F. New Jersey.

SELL Advice! Amazingly profitable business. Prospex. Box 6404A. Jacksonville 5. Florida.

SET rhinestones in plated backs. Easy. Over 100% profit. Catalog 20c. Bergen Arts. 1288 Main Street. Hackensack. N. J.

FREE Book "505 Odd, Successful Businesses." Work home! Expect "Odd"! Pacific—37C. Oceanside. Calif.

"EVERYBODY Likes Candy." Learn to make professionally. (Our 43rd year.) Ragsdale Candies. East Orange. N. J.

SELL Stamps—I guarantee profits. Return envelope. Fairbrook. 133-21 Blossom. Flushing 55. New York.

$500,000 BY mail from home. Free Folder. Publicity. Kalamazoo 65EA. Mich.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly. Classified Adv. Mgr., Dept. 1253. Popular Science Monthly. 353 Fourth Ave. New York 10. N. Y.

23 BOOKS & MAGAZINES

BIG Catalogue: 1500 bargains, send 10c. Books. 3100 Ocean Parkway. Brooklyn 35.

SPARETIME Profits Taking Subscriptions. All Magazines. Wholesale Catalog Free. Cassell Agency. Westfield 1. N. J.

TERRIFIC new self-help book Cyclegram teaches science of life cycles in minutes, promotes success in love, business, health. 64 pages retails $1. Wholesale introductory special 2 for $1. Cyclegram. Box 301. South Pasadena. Calif.

ATHEIST books. Catalogue free. Truth Seeker Co., 38 Park Row. New York 8.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service. 620-K East 178 Street. New York 57.

NATIONAL Geographic Magazines 1888-1952. Any issue. Periodical Service. Box 465-PS. Wilmington. Delaware.

BOOKHUNTERS! Scarce, unusual, miscellaneous books supplied. Atlantic Book Service. 2 Lawrence. Charlestown 29. Mass.

GERMANY export import industrial directory 65,000 addresses. English index. $9.00 postpaid. Burke Associates. Manchester 3. Mass.

CREW-cut mask baldness. It really works. Details free. W. Henderson. Box 361. Maywood. Illinois.

BOOKHUNTERS! All subjects! Send wants! Plymouth. Box 365-G. Far Rockaway. New York.

24 HYPNOTISM

FREE Illustrated Hypnotism. Selfhypnosis. Catalogue. Write: Hypnotist. 1324 Wilshire. Hollywood 17P. California.

MCGILL'S illustrated self-hypnosis course. $2.50. Guarantee. Catalogues featuring internationally famous Hypnotism Center publications. 10c. Lloyd Collins. Appalachia. Virginia.

"HYPNOTIZE the First Day" instantaneous hypnotic sleep, or your money back. $2.00. Lewis. 4009 Lake Park. Chicago 15.

AMAZING record! Hypnotizes; transfers control to you. Instructions. $2.95 ppd. Information free. Hypno Records. Dept. P. Box 405. Hermosa Beach. Calif.

HYPNOTISM. Sample lesson Free. Write Baltimore School of Hypnotism. Dept. 312-A. 4214 Belmar Avenue. Baltimore 6. Maryland.

MECHANICAL Hypnotist, new invention causes trances immediately. Instructions, secrets included. $2.00. Click. G.P.O. Box 1312. New York 1.

25 MAGIC TRICKS, PUZZLES, ETC.

90 PAGE Novelty-Magic catalog with Novelty. 25c. Allen. Dept. PST. Clinton. Missouri.

POPULAR SCIENCE OPPORTUNITIES

MAGICIANS, Gamblers books, supplies exposed. Free Catalogue. Book, Box 671, St. Louis 1, Mo.

500 TRICKS. Douglas famous 120-page Catalog, only 10c. Fastest service to magicians for 30 years. Send 10c today. Douglas Magicland, Dept. 2, Dallas, Texas.

FREE Catalog. Best Magic, Practical Jokes. Top Hat Magic, Evanston 22, Ill.

ENTERTAIN With Magic—Hobby or Profession. Write—Marsh's, 237 W. 11th, Columbus 1, Ohio.

2500 TRICK Catalogue (512-pages), pocket, parlor, stage. World's Finest Magic. Catalogue $2.00 (dollar trick included free). Kanter's, S-1311 Walnut, Philadelphia 7.

WOODEN Nickels. Catalog, trick, 25c. Fun'n Magic, 423-S North St. Marys, San Antonio, Texas.

MAMMOTH Amusement catalog, magic, jokes, Houdini Sensational Escapes, Spiritualism, 224 pages wonders, also Mystery Book Shows you How—all prepaid send one dollar. Magician Heaney Co., Oshkosh, Wisconsin.

BE a Magician. Large professional magic catalog of latest tricks, 35c. Ireland, F-109 North Dearborn, Chicago.

VENTRILOQUISM — Easy instructions, 25c. Dummies, Magic. Catalog free. Leaderbrand, Cal Allen, Texas.

"JUMBO" Catalogue!! — Tricks!! — Magic!! — Funmakers!! 10c. Rick's, Box S-260, Chicago 90.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

26 COIN COLLECTING

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 53 years.

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-50, Mass.

OLD Money Wanted. Will pay $100.00 for 1894 Dime, S. Mint, $50.00 for 1913 Liberty Head Nickel (not Buffalo). Big premiums paid for all rare coins. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

WANTED—1894-S Dime. Pay $500.00. Certain 1913 nickel $1,000.00. 1901-S quarter $20.00 to $150.00. Hundreds of others. Know their true value. Complete illustrated catalogue 25c. Worthycoin Corporation, (D-301), Boston 8, Mass.

$1,000.00 JAPANESE Invasion Note $1.00. 100pp. Illustrated Coin Catalogue 25c. Shultz, Salt Lake City 10, Utah.

LIBERTY Nickels 10 Different $1.00. 15 Different $2.00. Rhodeco, 105 Windsor, Reading, Pa.

WHAT Are your coins worth? Amazing Fell's new 1953 United States coin book. Everything on every single coin minted—Worth, value, how to sell, speculating, investment; other valuable facts. Clothbound. 150 illustrations. Send no money. Pay postman only $1.50 (plus postage) or $1.50 postpaid (refundable). Order now! Fell Publishers, 386-U312 4th Ave., New York City 16.

FIFTY Indian head cents $2.00. Sayers, 1000 East Unaka, Johnson City, Tennessee.

103 DIFFERENT Foreign Bills—$1.00. Free List. Dwight Musser, Dunbar, W. Va.

WORLD'S Greatest Magazine for coin collectors and wooden nickel 10c. Lawrence Brothers, Anamosa, Iowa.

28 STAMP COLLECTING

200 DIFFERENT, including Roosevelt triangle, 5c to approval applicants. S. Avalon Stamp Co., Springfield, Mass.

FREE—Complete set of Famous Americans, Flags, Parks and Presidentials to approval buyers. Send 3c for 15 of the above stamps plus full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 212, New York 28, N. Y.

POLAR Bear Triangle; Giant George Washington, Six Colored Ecuador, Arctic Triangle, first American commemorative, Corsica, Devils Island, others. Everything free with approvals. Capital Stamps, Little Rock 10, Ark.

FREE! Powerful Magnifying Glass for 5c Post. Bargain lists and approvals. Jamestown Stamp Co., Dept. 202, Jamestown, New York.

FREE Stamp Collection:—100 different stamps from Europe, Africa, Asia, Scandinavia, Balkans, etc., 3c to approval applicants. Tatham Stamp Co., Springfield 50, Massachusetts.

FREE. Valuable mystery gift. Approvals. Raymax, 37-X Maiden Lane, New York City.

65 ALL Different U.S. Stamps. Includes 50 yr. olds, commemoratives, airmails and $5.00 Stamp. Only 10c. Approvals. Willett Co., Box 511-M, Port Chester, New York.

ALBUM! Capacity over 1,000 stamps! Only 10c!! Stampmart, Hartford 1, Conn.

AMAZING Offer! 200 United States stamps—including commemoratives, airmails, high denominations to $1.00—only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

312 MIXED U. S. only 10c to "Gold Nugget" approval applicants! Nothing like them. Kessel's, Folsom, California.

SPECIAL!! Nudes collection; approvals —5c. Atlas, 2830-P Eisenhower, Racine, Wisconsin.

327 DIFFERENT Stamps 25c! Including early Canada, Newfoundland, British Colonies, Vatican, Red Russia, Hitler Heads, Indian States, Animals, Airmails, French Colonies, Rarities, Unusuals. Every Stamp different. Rare bargain with approvals. Money back guarantee. Niagara Stamp Co., Niagara-on-the-Lake 62, Canada.

EXCHANGE Your Duplicate Stamps. Send 100-200 different foreign and dime. Receive all different. Patterson, 5622 Broadway, Lancaster 23, New York.

"WOW! 203 All Different Germany 15c" Zeppelins, Semi-Postals, Airmails, High Values. Big bargain lists and approvals included. Jamestown Stamp, Jamestown 509, N. Y.

3000 DIFFERENT Worldwide $4.75; 5000, $9.50. Buywise, Box 115T, Hollis 23, N. Y.

AUSTRALIA, 47 all different, 10c. Anderson, Box 52, Seaside Heights, N. J.

COLOSSAL Stamp Zoo 10c. Jungle Beasts, Wildlife, Domestic animals—Fifteen different, including Rhinoceros, Elephant, Snake, Tiger, Zabu, Kangaroo, Koalabear, Emu, Kookabura, Bull, Horse —Extraordinary accompanying approvals. Niagara Stamp Company, Niagara-on-the-Lake 52, Canada.

FREE Sets; colorful surprise 10c. Approvals, trades—Bristol Stamps, Collinsville, Conn.

12 PACKETS from 12 different countries $1.00. Mammoth Packet List Free. Econopackets, Box 168, Riverside 22, Calif.

51 DIFFERENT from 51 countries, 10 cents. Schmidlin, Dep't. 8, Russiaville, Indiana.

INDONESIA Famous American Bicolors. Complete, Only 10c. Approvals. Welles, Box 1246-V, Church Street Station, New York City 8.

225 STAMPS For Only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries cataloguing up to 25c each! Also approvals. Mystic Stamp Company, Camden 55, New York.

100 DIFFERENT U.S. 50c. Approvals. Utechts, 1143A North Keeler, Chicago 51.

1,000 STAMPS for you to look at—big, attractive approval books of beautiful stamps. Pick and choose to suit yourself, at 1c to 5c each! Let us show you the economical way to a large, worthwhile collection. Wolverine Stamp Service, Dept. D-3, Fruitport, Michigan.

ROOSEVELT Greece, Pope Triangle, Greenland, Israel, 51 others, 5c. Approvals. Longhorn, Box 3068P, Lubbock, Texas.

LION Triangle Mosquito, 104 others, all different, 5c, with approvals. Mercury, Scarboro Junction, Ontario, Canada.

222 ALL different 10c to approval applicants. Jayne, Gravesend Sta., Brooklyn 23, New York.

FREE: Mint British Colonies from Tonga, Seychelles, Brunei, Transjordan, Sarawak, Solomon Islands, Caymans, Gilbert Ellice—Free with approvals. Viking, 11-P Northern Blvd., Great Neck, N. Y.

GORGEOUS Orchid Diamond plus Enormous 5-colored Flag, Will Rogers airmail, First American commemorative, Midget, Corsica and 25 others all 3c to approval buyers. Belmont Stampco, Washington 15, D. C.

DEALERS Wholesale catalog. Postage 3c. Frankscо, 5031 Queensbury, Baltimore, Maryland.

MIDGET Triangle—Giant Diamond, Rhino, Greenland, 28 others, 3c Approvals. Vidal, 3396 Alta Vista, Cincinnati 11, O.

COLONIAL Collection Free—Magnificarolous collection, British, French, American and other Colonies. Flowers, Animals, Commemoratives, Triangles, Pictorials, High Values all free "plus" Philatopic Magazine. Send 5c for postage. Empire Stamp Company, Dept. PR, Toronto, Canada.

500 WORLDWIDE stamps 50c to approval applicants. Faith, 1339½ Westminster, Alhambra, Calif.

U.S. Complete Sets unused Farley Parks $1.75. Flags 90c. Presidential Coils 60c. Parks $1.60. Illustrated U.S. list, Standard, 1084OG Woodview, Parma Hts, 30, Ohio.

105 DIFFERENT stamps including triangles, diamonds, rarities, pictorials, commemoratives, and topicals only 10c. With approvals. Cassidy, Hampton 600, New Brunswick.

TRIANGLES, Airmails, Bicolors, USA stamp centenary, Columbus, Trieste, Garibaldi, fortresses, large historical pictorials, 3c to Approval Buyers. Fortune Stamp Company, PSM3, Washington 10, D. C.

FREE! Monaco nude set. These popular stamps offered new approval applicants. Moumblow, Box 278M, East Northport, N.Y.

ITALY, 100 Different 10c with Approvals. DeRespinis, G.P.O. Box 771S, New York 1.

OLD scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfield, Clintonhill Station, Newark 8, N. J.

50 DIFFERENT Juventute stamps $1.00. Ernst Schmid, Hauptpostfach 255, Zurich, Switzerland.

BEAUTIFUL New Zealand 1943 Elizabeth and Margaret Rose triangles only 10c to approval applicants. George Richie, 1539 Sixth, Alameda, Calif.

FREE 119 Foreign Stamps including Africa, Australia, Pakistan, China, India, Russia and Scandinavia. Send 10c for postage and handling. With approvals. Niagara Stamp Co., Niagara-on-the-Lake 82, Canada.

UNITED States—53 different including 8 airmails, 15 commemoratives, 10c. Approvals. Sunsets, Box 47, South Gate, Calif.

GIANT approvals thousands different 1 and 2c. Wahl's Stamp Exchange, 7008 Farragut, Chicago 31, Illinois.

UNITED States—40 different 10c; 40 different Commemoratives 25c. No approvals. Seidenberg, Appleton 944, Wisconsin.

60,000 DIFFERENT, on approval! World-Wide. Cole, 43-G Rinewalt, Buffalo 21, N.Y.

50 BRITISH Empire—All Different—Plus Illustrated Book "How To Recognize Rare Stamps." Only 10c with approvals! Kenmore, Milford G-9, New Hampshire.

POPULAR SCIENCE OPPORTUNITIES

FREE. Scott's International Album, other premiums. Details with approvals. Raymax. 35-X Maiden Lane. New York City.

PHANTOM Plane Airmails—genuine flown copies from French West Africa (C12-14) handsome, mammoth stamps, with high catalog value—plus packet stamps from 50 different countries—all for 25c! Interesting approvals. Modern Stamp Co. Dept. B-3. Ferrysburg, Michigan.

FREE Congo Flower Set. Approvals. Eagleco, 6916 Roosevelt Boulevard, Philadelphia 49, Pa.

SENSATIONAL Twenty-five different colorful pictorial complete sets plus desirable bonus packet everything only 20c. Bargainful Approvals accompany. Dresel, Box 270-S, New York 25, New York.

299 DIFFERENT Worldwide Stamps 25c, plus Hitler Heads, British Colonies and attractive stamps on foreign cover. Everything complete 25c to adults requesting approvals. Canada Stamp Co., 1907 Main St., Dept. 119, Niagara Falls, New York.

ALBUM, 100 Diff. stamps, 3 premiums—20c. Smithco, Box 6618, Northeast, Kansas City 23, Missouri.

FREE Sample—Interesting, informative. Illustrated! National Stamp News, Anderson, South Carolina.

PENNY Approvals by country. M. H. Hoerning, 102, Farmington, Ark.

27 HITLER Stamps from five Nazi dominated countries. Historically valuable collection only 5c, to approval applicants. Gulfstream PSM, Hillsdale, New Jersey.

AUSTRIA—packets, sets, singles. Lists 10c. Henry Faville, Box 2005, Madison 5, Wisconsin.

FREE 4 Germany pictorial sets. Approvals. Pleasure Stamps, 1865A 52nd, Brooklyn 4, N. Y.

FREE! Scott's International Albums Parts 1, 2, or 3. To regular customers foreign approvals. Hal Buck, 935 Waterloo Road, Stockton, California.

CANADA—100 Different, 25c with approvals. Crown Stamps, Box 331, Toronto, Canada.

50 DIFFERENT Argentine, 10c. Approvals. Reuter, 611-D W. 40th Pl., Los Angeles 37.

WOW! 7972 Different Worldwide Stamps From 36 Stamp Companies With Approvals $8.00. Names 1000 Stamp Collectors $5.00. King, 32 Alexander, Kamloops, B.C., Canada.

FREE U.S. mixture and bargain list. Rothberg, X123PS, Braintree 84, Mass.

50,000 STAMP Grabags 25c each. Anderson, 630a Bingaman, Reading, Pa.

333 STAMPS 10c! Amazing value. Approvals. Star, Box 478A, Alice, Texas.

NEW Zealand triangles. Queen Elizabeth. 10c with approvals. Seminole Stamps, Box 1138-S, Coral Gables 34, Fla.

OPPORTUNITY! Gorgeous lot with Triangles, Giants, Midgets, Flags, Airmails and Railroad Stamps. Also, Guiana, Brunei, Mongolia, Sarawak, Etc. Everything only 10c to approval applicants. Evden, Valley Stream 25, New York.

1000 FINE Mixed U.S. Stamps 25c. Wright, 201 Mealey, Hagerstown 2, Md.

LOCOMOTIVE — Airplane — many Pictorials. Free with approvals. Wirth, Melrose Park, Norwich, Conn.

STAMPS Galore! Foreign mail clippings 25c ounce, $3.50 pound. Uhl, Lantana, Florida.

FREE Foreign Stamps. Approvals. Durham Stamps, Box 567, Burbank, Calif.

SENSATIONAL U.S. Confederate States catalogue free. Stone, 45-S Bromfield, Boston 8, Mass.

ZOUNDS! Exciting "Strange Countries" Packet—Free with approvals! Saxon, Vista, California.

WONDERFUL Offer Seven complete mint sets only 10c with approvals. Reich (S26), 1033 Lawrence, Chicago 40.

WANT better stamps? Try our quality United States, Foreign approvals. No. Andover Stamp, North Andover, Mass.

BARGAINS galore low priced approvals. Chur, Box 245, Buffalo 12, New York.

500 WORLDWIDE Mixture. Big Variety 25c. Mo gar, Fairmount, Cincinnati 14, Ohio.

U.S. 500 Mixed 25c, 1000-40c, 50 Different 10c, 50 Different Commemoratives 25c. Sibley, Mendon, Mass.

100 DIFFERENT British Empire 10c with approvals. Sadler, 9013 Central, Kansas City 14, Mo.

½# U.S. Mixture. Old-New. 50c. Lists. Weatherby, Medina, Ohio.

EXCITING unusual stamp packet! Only 10c with approvals! Plymouth, Box 365-H, Far Rockaway, New York.

DIFFERENT? U.S. to your order. No approvals. Free lists. Wm. Kuehl, 3125 East K, Tacoma 4, Washington.

TWO mint U.S. plate blocks only 25c with approvals. William Wern, 333 No. Michigan, Chicago 1, Illinois.

★★ 5 TRIANGLES 2c with approvals. Choice Stampco, P.O. Box 424, Miami 3 Florida.

100 DIFFERENT with worldwide approvals 10c. Jacobsen, 4395-B Broadway New York 33.

"MONACO Nudes" (5). 10c with approvals. Royal Stamp Company, Tamaqua 2, Penna.

MAGNIFICENT; Nineteenth Century U. S. Plus Civil and Spanish War Revenues. 20 Different 10c To Approval Applicants. AAA Stamp Company, Arcade Building, St. Louis 1, Missouri.

BAHAWALPUR Silver Jubilee mint set free to applicants of U.S. or British Colonial approvals. Alan A. Taylor, Skyland, N.C.

START your own Stamp Business. Send for Free circular. Donald Shepard, Box 1147, Chicago.

FREE. 250 stamp hinges and 20 different Canada with approvals. Jaydee, 218 West Dickinson, Grand Rapids 7, Michigan.

UNBEATABLE! 30 complete sets, $1.00 Approvals. Pinkerton, Box 81-M, Bethlehem, Penna.

100 DIFFERENT Spain 25c. Penny approvals included. Reed, Box 980 Chicago 90, Illinois.

50 DIFF. Finland 10c with approvals—Carroll's, W-310C Sprague, Spokane, Wash.

COMMEMORATIVES—U.S.—Your choice 20 Mint or 75 Used. All different. $1.00. G. M. Granstrom, 612 Orange, El Centro, Calif.

FREE! Unique illustrated bargain catalog of Mixtures, Packets, Accessories. Many pages, values galore for any collector! Latest releases! No approvals. Towerco, 1630 West Melrose, Chicago 13.

500 STAMPS, all different, 50c. Eddie Stoka, 10511 Peoria, Chicago 43, Illinois.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

29 ANTIQUES, RELICS & INDIAN GOODS

OLD Guns. Prices. Free catalog. Pioneer Press, Harriman, Tennessee.

PROCRASTINATING?—Am selling several hundred Historical Firearms.—30,000 Prehistoric Relics. Collectors Cartridges. Coins.—Revolutionary, Confederate, Civil War Flintlocks, Muskatoons, Revolvers, Blunderbusses, Winchesters, Carbines, Buffalo Rifles, Pepperboxes, Kentuckies, Frontiers.—400 Bayonets, Swords, Bullet Molds, Ramrods, Gun Parts.—Powder-horns, Blo-horns, Bo-wood, Deer-steer-buffalo horns.—Arrowheads, Tomahawks, Hammerstones, Spearheads.—Dauguerrotypes, Violin Wood, Agates, Minerals, Fossils, Gold Dollars.—Catalog profusely illustrated, 35c. Heike, (Dadeville), Wenona, Illinois.

ARROWHEADS, location given, four $1.00 (24-$5.00). Bird Points, two $1.00 (dozen $5.00). Book-Relic Catalog 10c. Tilton Relics, Topeka 10, Kansas.

4 FINE Indian Arrowheads $1.00. Good Grooved Tomahawk $2.00. List free. Lear's, Glenwood, Arkansas.

BEAUTIFUL Black Obsidian Arrowhead $1.00. List. Moise Penning, Klamath 3, California.

ANTIQUE Firearms, pistols, percussion flintlocks, list 25c. Westbrook, 738 Royal Street, New Orleans, La.

30 MINERALS & PRECIOUS STONES

INDUSTRIAL mineral prospecting pays big when you "Hit"! Free instructions. Stratex Instruments, 1861G Hillhurst, Los Angeles 27.

GEMSTONES. Mineral specimens. Every variety. Lowest prices. Postcard brings free booklet. Plummer's, 4720 Point Loma Ave., San Diego 7, Calif.

GEMOLOGY Books! Catalog 10c. Atlantic Books, 2 Lawrence, Charlestown 29, Massachusetts.

SAPPHIRE—tourmaline — topaz — garnet — peridot, 5 uncut gem specimens, $1.00. O'Briens, 1116B Wilcox, Hollywood 38, Calif.

COLLECTORS. Two Dollars brings twelve beautiful genuine specimens from gemland Brazil. $5.00 brings perfectly cut ten carat Brazil topaze. Airmail bills or check. Jean Bach, 413, Praia Icarai, Niteroi, Brazil.

CRETACEOUS Fossils (Exogyra arietina) 2 for 25c, 10 for $1.00. Hawkins, Route 4, Georgetown, Texas.

COLLECTION Colorado Gems, identified, $1.00. Bader's, 859 East LasAnimas, Colorado Springs, Colorado.

COMPLETE chemical analysis of minerals and ores, $3.00. Garger's, 2172½ Beverly Glen, Los Angeles 25.

WYO. Jade or Sweetwater Agate 25c. specimens—jewelry—setting, etc.—free list—Hays, 417 West 17th, Casper, Wyoming.

31 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 631-E St., N. W., Washington 6, D. C.

4 HOTEL Baggage labels 25c. Copleston, 1555 Odell, New York 62, New York.

CLEARANCE Sale! Army Patches 3c up; Catalogue 10c; 32 different emblems $1.00. Hobbyguild, 550 Fifth Ave., New York City.

MILITARY Miniatures Catalog 25c. Bob Bard, Box 1463, Baltimore 3, Maryland.

WANTED — Cigarette, tobacco cards. Write Charles Bray, East Bangor, Penna.

EXCITING Hobby; collect Authentic Military Patches, Insignias, Campaign Ribbons, Navy Rates, etc. 57 assorted $1.00. Free gift. Pritt, Dept. S-12, 12 West 27th, N. Y. C.

MILITARY Miniatures: U.S. Marines, American Revolution, Civil War, Custer's Cavalry. Illustrated Catalog 25c. Bussler Miniatures, Dept. E, 59 Russell Park, Quincy 69, Mass.

NAZI, Soviet, Campaign ribbons, big packet. Lists $1.00. Medcrafts, 1923 34th St. SW, Calgary 3, Canada.

UNUSED matchbook covers—100 different $1.00—36 page Catalog 25c.—Charles Edelman, 1311P East 84, Cleveland 3, O.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

35 MM—36 Exp. Develop & Jumbo Print each $1! Guaranteed Quality—Free Mailer. Flash Photo, Box 36P, Parksville Sta., Brooklyn 4, N. Y.

TWO Prints each good negative. 8-exp. 35c; 12-exp 50c; 16-exp. 65c; Reprints 4c. Mayfair Photo Service, Box 617-A, Toledo, Ohio.

PHOTOGRAPHY For Pleasure or profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 1746, Chicago 14.

OVERSIZE Prints no extra charge. 8-exposure roll, 30c. 12-exposure, 45c. 16-exposure, 55c. Reprints oversize 4c. Finest quality. Mail Order Photo Service, Box 297, Watertown, Wisconsin.

POPULAR SCIENCE OPPORTUNITIES

PHOTOS copies—20 Wallet-Size deluxe prints $1.00. Original picture returned. Send any size photo or negative. (No C.O.D.'s Please) Federal Wallet-Size Photo Co., Dept. P.S., P. O. Box 2448, Kansas City 6, Mo.

KODACOLOR Prints by Eastman for Christmas. Special Handling. Send Kodacolor negatives. Send 2x2 color transparencies and 25c for making each Kodacolor negative. Prints: 3½x5—37c; 5x7—$1.75; 8x10—$4.00. Order by December 10th. Free catalogue and mailer. Fascolor Service Company, Box 86, Rochester 1, New York.

TOP Quality Fast Service. 8 Exposure Roll Jumbo Finish Super Pak Album Only 35c—16 contacts 40c. Free Mailers. Complete Photo Finishing Service. Satisfaction Guaranteed. Grand Fotos. GPO Box 1410, New York 1, New York.

SENSATIONALLY New—16 oversize contact prints or 8 plastic bound superpak album jumbo prints with your first roll 25c. Album Studios, Weatherford, Okla.

ENLARGEMENTS! Eight 5x7's or five 8x10's, $1.00. Wilart Enlargers, Box 967, Little Rock, Arkansas.

ROLL developed and 4x6 or 3¼x4½ oversize glossy velox prints 8 exposures 40c, 12 exposure 60c, 16 exposure 80c. Hagner Photo Service, 1318 West Columbia Avenue, Philadelphia 22, Pa.

FREE Mailers, contact prints 4c. Jumbos 5c. 25 Photo Xmas Cards $1.95, 100—$6.75. Western Photo, Dept. PS123, Box 298, San Francisco 1, Calif.

CHRISTMAS Cards from your favorite negative, 18 for $1, including envelopes, 60 cards $3. Send 15c for postage and packing. L. A. Eastman Studio, Bode, Iowa.

33 MOTION PICTURES, SLIDES, SOUND EQUIPMENT

GUARANTEED Fresh 8mm roll, magazine; 16 mm roll, magazine movie film. Color, b&w. Free catalog. Eso-H, 47th Holly, Kansas City 2, Missouri.

MOVIE Camera Film: 8 mm roll $1.50, 16mm 100' $3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue. (sample film 10c). Garden Film, 317 West 50th, New York 19.

FREE Giant catalog of 8mm & 16mm films for home movie enthusiasts. Films for every occasion. Lee Stann, Dept. PS12, 11 Willard Ave., Mt. Vernon, New York.

WILD Life Films. Exciting, dramatic action in the natural habitat of animals of forest and plain. 8mm or 16mm in beautiful color or B. & W. Also 2"x2" color slides. Write for free illust. literature. Wild Life Films, 5151BM Strohm Avenue, No. Hollywood, Calif.

TAPE Recorders, Tapes. Accessories. Unusual Values. Dressner, 624 East 20th Street, New York City 9.

5,000 NEW-Used 8-16mm. Silent-Sound Films. International, 2120 Strauss, Brooklyn 12, New York.

TITLES and Christmas Carols on 35mm color slides. Free illustrated list. Slide Titles, 1440 Broadway, New York 18, N. Y.

RENT 16MM sound films 50c reel. Large selection; free catalog. U. C. Film Service, 128 Chestnut St., Roselle Park, N. J.

BARGAINS 16mm sound films also for exchange. Bedner, 5300 So. Talman, Chicago.

EARN up to $15.00 daily with your movie projector! Details free. Metcalf, 10806 Glenroy, Chicago.

NEW Movie Bargains! 50' 8mm. Prevue film, 59c. 300' 16mm. silent film (value $9.75), $1.98—our title choice. Blackhawk 8mm. films—Children's Films, Railroads, Collector's Items, Hunting, Fishing—150' $2.98; Bible stories 300', $7.98. New, used 16mm sound, silent bargains, too! Six used 100' 16mm. reverse-image Panoram musicals, $3.49. Good used 16mm. sound projectors—all leading makes—$129.95, some $99.95. Big catalog free. Blackhawk Films, 1128 Eastin Bldg., Davenport, Iowa.

8 & 16 MM Professional National Parks Movies in full color. Reasonable. Ideal Service, 4644 Geary, San Francisco 18, California.

34 CAMERAS, PHOTO SUPPLIES

BASS Says: Trading cameras a national habit since 1910. Write to Bass the old "Horse Trader." A postcard will do. Simply say: "Bass, I have and I want . . . How much will you allow me?" Satisfaction guaranteed. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

PHOTOGRAPHY For Pleasure or profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 172C, Chicago 14, Ill.

BUY wholesale nationally advertised cameras, photo supplies, thousands other products at big discount. Free "Wholesale Plan." American Buyers', 629-SS Linden, Buffalo 16, N. Y.

WHOLESALE Photographic Supplies, Cameras, Films, Projectors, Enlargers. Write for Free Catalog. Capitol Photo Supplies, 2428 Guadalupe, Austin, Texas.

TAKE Better Pictures! First new Popular Science camera book in 10 years! 256-page "Everybody's Photography Manual" shows you how to take better pictures. Over 750 illustrations; new facts on films, cameras, developing, home movies, accessories, more! Only $2.49, satisfaction guaranteed. Popular Science, Dept. 1253C, 353 Fourth Avenue, New York 10, N. Y.

35 MUSIC, INSTRUMENTS & SONG WRITERS

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

POEMS Wanted for musical setting. Send poems. Free Examination. Five Star Music Masters, 646 Beacon Bldg., Boston, Massachusetts.

POEMS Wanted for musical setting. Send poems. Free examination. Crown Music Company, 1472 Broadway, New York City 36.

SONGWRITERS! Protect your poems and songs! Don't mail anywhere! Write for safe procedure! Song Service, 333 W. 56th, Dept. P.S., New York 19, N.Y.

SONGWRITERS! Let me help you. Stamp for booklet. Mark Rubens, 146-C West 79 Street, New York 24, N. Y.

SONGPOEMS Wanted. Mail to: Tin Pan Alley, Inc., 1650 Broadway, New York 19, N.Y.

GUITAR—Easy as pie. Quick, new simplified course. Individual mimeographed lessons. Arranged by popular Radio artist. $2.00 complete course. Brunswick Management, 505-Fifth Avenue, New York 17.

SONGWRITERS. Impress publishers with recordings that we make from your "lead sheet." Details Free. Masterpiece Recording, 1 E. 54 St., N. Y. 22, N. Y.

SONGWRITERS! Send poems, songs. Music Service, 243 West 72nd St., PS, New York 23.

POPULAR Songs. How to write and sell them. Write for free booklet Successful Songwriting. Gateway Songs, Box 2470, Hollywood 28, California.

INSTANT piano playing! New Method Assures Instant Results! Praised by thousands! No Piano Needed! Study home—play anywhere! Write now! $2 Postpaid. "Instant Piano", Dept. 2100, Parkville Station, Brooklyn 4, New York.

FREE Record of your song—Your words—My melody. Free information. Johnny Mack's Melody Mart, 1094 West 39th Street, Dept. K, Los Angeles 37.

POEMS Wanted for musical setting. Send poem for immediate consideration and Free Rhyming Dictionary. Richard Brothers, 46 Woods Building, Chicago 1.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

SELF taught courses: Piano, singing, songwriting, and other instruments. Song collections. Music Teachers' Associates, 26P Potters Lane, Great Neck, New York.

1953 ACCORDIONS — Wholesale. Free catalog. American Accordion Center, P.S.-12, 5329 Belmont, Chicago.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

MAKE simple, tubeless, batteryless, distance-getting crystal radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S, Clinton, Mo.

FREE Radio Tester, Tools, Soldering Iron. Build and keep 15 guaranteed high quality Radios and Test Equipment—only $19.95 complete. No experience required. Money-back guarantee. Order direct or send for descriptive literature. Free—valuable Radio and TV Repair Guide on request. Progressive Electronics, 497 Union Ave., Dept. PS-12, Brooklyn 11, N. Y.

LIMITED Quantity surplus double headphones. High quality. Slightly used. $7.95 Value. Special now $2.95 postpaid. Guaranteed. Allen, Dept. PSH, Clinton, Mo.

SEND $3 Crystal Radio set complete. Box 2929, Odessa, Texas.

RADIO-TV Troubletracer. Fix all Radios and TV Sets. Become serviceman Overnight. No experience needed. Guaranteed. Complete. Send $2.25 plus 20c postage. International Instrument Development Co., Dept. PS-1, Box 31, Brooklyn 11, N. Y.

NEW TV Catalog Free. Loaded with bargains for TV servicemen, technicians, installers. Finest new TV antennas, Motorless Directronics, Multi-Channel Yagis, UHF Antennas, Converters, Motors, Boosters, Parts, Instruments, hundreds of quality accessories at money-saving prices. Get your catalog now! National Electronics, 4112 Deico Bldg., Cleveland 3, Ohio.

CRYSTAL Radio experimenters. Write Leslie Hulet, R. 4, Lakewood, New Jersey.

MAKE simple powerful distance-getting crystal radio. Works anywhere. Illustrated booklet fifteen cents. Money back guarantee. Francis, Box 5963, Cleveland, Ohio.

CLEARCO Crystal Radio kit $1.50, pre-assembled $1.75, free catalogue. Clearco Crystal Co., Box 1857, Milwaukee 1, Wisc.

BUILD two way crystal set. Receives radio signals or music from phonograph. Complete plans 50c or radar type fixed crystal and plans $1.00. Bean Electronics, Box 582, Bellflower, California.

TVeto silences annoying television, radio commercials! Operates from your viewing chair. Attach it yourself to any set, it's easy, harmless! Money back guarantee. $2.95 postpaid. TVeto, Box 444, Arcadia, California.

TALKIE Crystalphone: Nearest thing to a real Walkie Talkie. Talk and receive Radio programs. Instructions 50c. Talkie Crystalphone, Valley Road, Box 27, Clark T'W'P-Rahway, New Jersey.

CRYSTAL Set experimenters. New book devoted entirely to "Theory, Design and Operation of Crystal Receivers" written by graduate engineer. Amazingly thorough, covers transistors; easy to understand. Over 16,000 words; 132 illustrations, charts, circuits. Only $1.50 postpaid. Don't miss your copy! Kott, 5024 St. Clair, Detroit 13, Michigan.

AMAZING photoelectric cell transforms light into electrical energy. Unlimited uses. Only $1.00. Springfield Enterprises, Box 54-N, Springfield Gardens, New York.

CRYSTAL radio kit, $1.50; Phone $1.75; Fixed crystal, 60c, guaranteed. Clearco Crystal Co., 1229 25th, Des Moines 11, Iowa.

SUPER Bargains! Radio-Television tubes and parts. Amplifiers, Phono oscillators. Test Equipment. Free Literature. Southard's TV, Box 464, Farmersville, Calif.

TELEVISION Interference Eliminated with amazing, easily installed, guaranteed, antenna high-pass filter. Unbelievable, only $1.00 postpaid. BMB Co., Box 8 Hillside Manor Branch, New Hyde Park, New York.

TUBES nationally advertised brands wholesale prices. Electronic Tube-Mart, 8709 114th Street, Richmond Hill, N. Y.

POPULAR SCIENCE OPPORTUNITIES

MAKE simple, tubeless, batteryless, distance-getting crystal radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S, Clinton, Mo.

REPAIR your own TV. Personalized instructions. Send model number and $1.00. LS Engineering, Box 4113, No. Hollywood, California.

STOP radio Television noise immediately. Patented filter plug eliminates interference household appliances, fluorescent lights, motors, oil-burners. Clears reception. No C.O.D.'s, try 7 days, money back guarantee. $1.00. Electronic Tube-Mart, 8709 114th Street, Richmond Hill, New York. Dept. PS-1253.

COLOR television! Enjoy multicolor filter screen now. Easily attached. Send $2 for your screen size. Satisfaction guaranteed. Zingo Products, Johnstown 9, N. Y.

37 BUSINESS OPPORTUNITIES

EXTRA Money—No Selling—operate vendors. Amazing profits, details Free. Silver King, Suite 221, 622 Diversey, Chicago 14.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

MAKE money addressing envelopes. Our instructions reveal how. Glen Glenway, 5713 Euclid, Cleveland 3, Ohio.

IMPORT-Export! Opportunity, profitable, world-wide, mail-order business from home, without capital; or travel abroad. Established World Trader ships instructions for no-risk examination. Experience unnecessary. Free details. Mellinger 69C, Los Angeles 24.

NEWEST Spare, Full-Time Business. $5 to $10 hour possible. Paint with Suede—the finish with touch. And eye-appeal. Beautify auto dashboards, signs, radios, toys, figurines, lamps—100, 1 others. Complete, Step-By-Step Instructions sent for no-risk examination. Free details. Coast, 1004-HJ, So. Los Angeles St., Los Angeles 15.

ENVELOPES addressed accurately, reasonably. Fast Service. We have capable addressers in your city. Glenway System, 5713-X Euclid, Cleveland 3, Ohio.

137 PLANS for starting home business. Details: Elite Co., 220-A Grand St., N. Y. 13.

VENDING Machines—No selling. Operate a route of coin machines and earn amazing profits. 32-page Catalog Free! Parkway Machine Corporation, Dept. 73, 715 Ensor St., Baltimore 2, Maryland.

MAKE Money spare or full time, casting Metal Toys and Novelties. Big wholesale and chain store demand for Autos, Soldiers, Ashtrays, Banks, etc. keeps manufacturers busy. Production moulds furnished for up to 100 and more castings per hour. No experience or special place necessary. Write for information and illustrations of patterns needed. Metal Cast Products Co., Dept. E, 1696 Boston Road, New York 60, N. Y.

TROPICAL Fish supplies. Save! Representative your area will supply. Nmoae, Box 4635, Los Angeles 24, California.

EARN Money Selling Binoculars, Rifles, Cameras. Send for free dealer bulletin. Nidorg & Co., 14-E Washington Place, New York 3, N. Y.

RECAST old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

LIVING miniature ("Ming") trees only 10 to 20 inches tall. Grow at Home. Big Profits! Spare time opportunity. Fascinating! Amazing! Write for Free Seed and Plan. National Nursery, Dept. CG, Inglewood 4, California.

BREED Rare Tropical Fish at home. Earn Big Money! Learn Secrets! Help fill huge demand. Amazing Opportunity! Free Plan. Tropicals, 1008-G Los Angeles St., Los Angeles 15.

RAISE Orchids—at home—big profits—fascinating. Year 'round any climate. No Greenhouse. Instructions, Including Blooming-size Orchid Plant, sent for no-risk examination. Free details. Flowerland, 4622-F Wilshire, Los Angeles 5.

LEARN metalizing baby shoes, gifts, etc. Bronze, gold, silver. Folio Free. Kiktavi, 7217-PS South Broadway, Los Angeles 3.

"MAKE Perfume" Catalogue Free—"International," 6347 Parnell-PS-12, Chicago 21, Illinois.

FIX typewriters. Free booklet describes our modern, inexpensive home-study course. Factory methods taught. Write Typewriter, Building 4, Tarentum, Penna.

$25 WEEKLY working two hours daily at home. Lycke, Box 2471-B, Cleveland 12, Ohio.

NATURAL Molding Latex. Extra Thick. Free Sample. Flock, Tinsel, Supplies. W. Wooley, 115-B Donald, Peoria, Illinois.

MAKE Money At Home as renewal headquarters for all magazines. Big Christmas sales profits now. Liberal Commissions. Supplies furnished. Write for Free Catalog. McGregor Magazine Agency, Dept. 510B, Mount Morris, Illinois.

MAKE Money selling by mail; instructive booklet 25c. Manhattan House, P. O. Box 51-L, Saint Albans 12, N. Y.

QUICK Money! "Repairing Car Batteries." At Home! Easy, Too! Batteryman, Grand Junction, Colorado.

OPERATE profitable spare-time "Home Letter Shop" by mail. Write Continental Publishers, 1332 So. 61st, Milwaukee 14, Wisconsin.

POPCORN and Potato Chip equipment. Long Eakins Company, 5363 High, Springfield 99, Ohio.

GET Dollars by Mail! Keep every Penny. Terrill, Bogard, Missouri.

BOOKKEEPERS—Earn more money. Operate amazing "No-Ledger" system. Spare or full time. Free bulletin. Write Frye, Box 432, Chester, South Carolina.

EARN Money Selling Jewelry & Home Appliances. Send for Free Wholesale Catalogue. Nidorg & Co., 14-L Washington Place, New York 3, N. Y.

HOW to Raise Needed Funds. Free details. Enterprise Bureau, Syracuse 2-S, New York.

HOW and where to obtain Capital? Free details. Star Service, Wapakoneta, Ohio.

INDUSTRIALISTS - Businessmen. Investigate Florida. Rapidly-growing Florida offers innumerable opportunities for business and large and small industries and a highly favorable tax situation. Write State of Florida, telling type of business you're seeking and specific requirements. You'll be put in touch with communities where opportunities exist and where you'll enjoy Florida's wonderful year-round climate. Free, complete information will be sent you. Write today: State Of Florida, Industrial Development Division, 4315B Caldwell Building, Tallahassee, Florida.

EARN Extra Money weekly mailing circulars for advertisers. Complete instructions—25c. Siwasilan, 4317-B Gleane Street, Elmhurst 73, New York.

"INCOME" from local information. No Selling. Write Neherco, LaVerne 6, Calif.

EARN Money With Typewriter—Sewing Machine. Details Free. Edwards, 3915-PS, 12th, Des Moines 13, Iowa.

ADVERTISING book matches—Cash in on big demand—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. PX-1253, 7530 Greenwood, Chicago.

SUNNY California Land Bargains as low as $5.00 per acre. Low Down payments—low monthly payments. Write for free information. Land Department, Suite 105, 1540 N. Highland Ave., Hollywood 28, Calif.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

LEARN Sewing Machine Repair, electrify, sell. "How" to make big money at home spare time. New zigzag machines, etc., wholesale. Details free. Taylor Service, Hamilton, Ohio.

START A Buying Service, buy wholesale thousands nationally advertised products. Make big profits selling at sizeable discounts. Postcard brings details. American Buyers, 627-S Linden, Buffalo, N. Y.

FREE! "301 Profitable Small Businesses!" Amazing shoestring plans! Work Home! Start Sparetime! Deumant Surveys, Kenmore 23-T, New York.

BUY Wholesale nationally advertised appliances, watches, etc. 1000 items for Christmas Catalogue 50c. International Sales Company, Dept. B, 175 Fifth Ave., New York 10, N. Y.

THRILLING Profitable Home Business. Make fast-seller chenille monkey trees, dolls, flowers. Terrific holiday demand. Information free. Velva, Bohemia 17, N.Y.

MONEY in new greaseless doughnuts. Start in kitchen. No smoke. Sell stores. Free recipes. S. Ray Co., 3605 South 15 Ave., Minneapolis 7, Minn.

BRONZED baby shoe metallizing equipment. New and used. Big selection of metal and onyx mountings. Free catalogue. Hollywood Bronze Supply, 1624-A E. First Street, Los Angeles 33, California.

EARN $50 weekly in spare time. Lifetime vitamin business. Details free! Emm-Bee, Dept. PS2, Box 992, New York 8, N. Y.

BOOKKEEPERS, increase earnings operating sensational bookkeeping service. Kern, 4942-B Vineland, No. Hollywood, Calif.

WE Love our mailman—He leaves over $1,000.00 monthly in our rural mailbox. My college professor husband drafted a scientific home mailorder method. We bought a Texas ranch, live as we always wanted. Now we sell the "Ranch Mailorder Method." Operates anywhere. Inquire: Eveningshade Ranch, Helotes, Texas.

WANTED! Home Producers, by manufacturers in our Clearing House Service. Become a subcontractor, casting plastic products for these companies. Thousands of easy-to-make items required. Cash in at home, without previous experience. Plastic Service Associates, Dept. 12-PS, East Boston 28, Mass.

BE Notary Public. Rate higher. Details Free. Stationers, Helotes, Texas.

FREE details! Home operated mailorder business. Successful "Beginner's" plan. Everything supplied. Lynn, 10420-C National, Los Angeles 34, California.

GET A New Start In Life In Collection Business. Free Details. Franklin Credit, Roanoke 7, Virginia.

HOW To Start A Mail Order Business (And Keep It Going). Details. Jorine, Snyders Lake, Troy, New York.

MAIL Post Cards At Home. Everything furnished. Keep all money—Orders Filled Free. Rush name: Schipper, 121-P Wilkins, Rochester 21, New York.

ONE man contracting business. $1.00 investment. Free literature. McComb & Son, Huntertown, Indiana.

MERCHANDISING with post cards! Details free, write Simmons, 88 Weaver, Buffalo 6, New York.

MINK Raising information free. Complete Lake Superior Mink Farm, Superior E E5, Wisconsin.

MAKE Rubber Stamps, repair dolls, learn invisible reweaving. Molding Latex. Catalogue of "60 Ideas." Universal, Box 1076-B, Peoria, Illinois.

NEW Exceptionally profitable plans, ideas for home operated mail business. Rush name, Miller, 1772-R Carlyon Road, East Cleveland 12, Ohio.

LIQUID Rubber, make flexible molds. Free Sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

WHAT'S Your Field Of Interest? Whatever it is, specialized magazines will help you to greater success. Look over current copies of those covering your field through our Easy-to-Get-Acquainted service. Choose from 4,387 publications covering all fields—business, vocational, agricultural, sports, hobbies, etc. Write for current list. It's free. Commercial Engraving Publishing Company, 348 North Ritter, Indianapolis 19, Indiana.

MEN Wanted introducing regulators. Secret electromechanical formula stops generator regulator and battery trouble. Few spare hours make $25.00, full time $1,000.00 monthly. Write how to start and get demonstrator free. Scientific Electric Co., Box 2162PC, Cleveland 8, Ohio.

POPULAR SCIENCE OPPORTUNITIES

$1000 A Week Possible With Great Triple Profit Plan. Edikars, Johnstown, Penna.

OPERATE profitable mailorder business. Splendid opportunity. For details write Harrison, Box 23, Bellflower, Calif.

EARN $2600 more a year from hour each evening at home laundering Venetian blinds. Others making over $10,000 working full time! New Portable machine. Free booklet. R. X. Co., 442 N. Seneca, Wichita 12, Kansas.

MAKE flexible molds! Cast plaques, bookends, figurines! Free sample! H. Tooker, 630-A Chestnut, Hamilton, Ohio.

OPERATE "Escalator" Mailorder system, selling our products or any products. Fastest, most revolutionary mailorder system known. Write: Selbyco, Decatur 175, Ill.

MAKE Money at home mailing literature offering fast selling books and merchandise. Everything supplied at low cost. Rush name. Thomas Jerdon, Hermansville, Maryland.

BUY Wholesale thousands nationally advertised products. Save money! Make Money! Postcard brings details. Kemah Company, 5017-E Washington, Houston, Texas.

MEXICAN Feather Bird Pictures 200% Profit your own business. Sample Offer Beautiful picture with hand carved cedar frame and glass $2.50 Value, only $1.00 Postpaid. Free Details. Specialty Products. Co., 302 New Market Ave., South Plainfield, New Jersey.

EARTHWORMS: Health and profits. Details 25c. Earthworm Gardens, Dept. PS12, Box 428, El Monte, Calif.

ELECTRO-plating. Profitable home business. Autoparts, mirrors, novelties, giftwares, baby shoes. Easy, inexpensive home processes. Free booklet. Tyco Metals, Box 13231-CP, Houston 19, Texas.

LEARN Piano Tuning quickly at home. Make big money—tremendous field! Amazingly easy. Free information. Empire School of Piano Tuning, Champaign 1, Ill.

50 MAIL Order Plans full or Spare time catalog free your name address. Lindholm Service, Box 2504, St. Ann Station, Minneapolis, Minnesota.

EARN amazing profits by following our instructions; selling nationally advertised watches, etc. Enclose 25c, refundable. Receive multi-colored salesman's catalog and confidential price list. Result Sales D, 580 Fifth Ave., New York.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, "Minnesota."

MAKE Perfumes And Cosmetics At Home, write "Carey Laboratories," 1914 Chouteau, PS-12, St. Louis 3, Missouri.

EARN $15,000-$30,000 annually. Franchise protected. Guaranteed minimum $12,500 or money back. Live at home. No merchandise to buy. Self-employed. One of most exclusive and noncompetitive businesses in United States and Canada. Send 50c for explanatory book. Money refunded when book returned. Harrell & Company, Box A-2, Louisville, Illinois.

BUILD luggage and cases at home. We sell your product. No special tools or equipment needed. Free details. Casecraft, 805-X Sunset Blvd., Los Angeles 12.

PLEASANT Spare Time Work. Write RTK, Box 6693-C, Cleveland 1, Ohio.

PACKAGED food mailorder business. Home operated. Everything supplied. Successful proven plan. Free details. Frazar Foods, Desert Springs 11, California.

WHAT must I do? Read "Success Today" and "Success Poison". $1.00 postpaid. Merrell Quinn, P. O. Box 967, Little Rock, Arkansas.

GROW plants, flowers. Details free. Shiffers, Box 129, Millersburg, Penna.

MAKE Money mailing cards; circulars. Pleasant; Profitable. Paton, Box 55-A, New York 23, N. Y.

EARN money at home, making rhinestone jewelry. Free catalog. Ebert, Box B183, East Orange, New Jersey.

FREE Folder—"Make Big Money by mail The Sure Way That Pays". New-different. Fullmer, 92J Greenwood, Pocatello, Idaho.

DO Mailing At Home—Get Orders In Every Mail. Keep Every Cent. Everything Furnished. Genmerco, Box 142-N, Dorchester 24, Mass.

HAVE Home Mail Business—Get $10 Orders In Every Mail—Keep $8.00. Everything Furnished. Hutchinson, 401C Adams, Dorchester 22, Mass.

WILL establish you in business with our capital. Part-time or full time. No investment or experience needed to start. Winona Monument Co., Winona, Minn.

MAKE Profitable Products — Formula Catalogue Free. "Imsco", 6347 Parnell-PS-12, Chicago 21, Illinois.

CONVERT hand mowers to power mowers. Do it now, this winter. Sell the Handy-Dandy conversion kits. Easily installed on 16 to 20" mower. Use any small gasoline or electric motor. Quick delivery. Kits purchased with or without engines. Also new garden cultivator. Takes less than a minute to change attachments: Weed Whacker, Lawn mower, Snow plow, and Rotary tiller. Discount to dealers. Le Claire Manufacturing Company, Le Claire, Dept. P.S., Iowa.

EARN money! Amazing plans! Easily mastered at home. Details free. Bruns, 216-E West Jackson Blvd., Chicago 6, Ill.

START a lettershop on a shoestring! Sales $56,000. Started $36.00. Information? Wells, Box 13, Basking Ridge, New Jersey.

FREE! Unequalled, big profits, home mailorder details. Mailord, PS-12, Southampton, New York.

PROFIT! Without Investment!! Through our Watch-Clock-Jewelry-Camera-Pen-Pencil Repair Service. Inquire Modern Technical Supply, 55-PS West 42nd Street, New York 36.

WOMEN! Make Big Money at home. Sew ties for us. It's fun. Earn $10 day easy. No selling, no experience, no machine necessary. We supply everything. Help us fill huge demand. Exciting details free. Fashion Ties, 2521-X, Manchester, Inglewood 4, California.

$100.00 WEEK—Preparing Income Taxes. Box 1343, Port Arthur, Texas.

UNUSUAL homework opportunity. Spinning Angora Sparetime. Men, Women. Angora House, PSM, Springfield, Illinois.

$2,000. MONTHLY—Easy. Instructions Free. Sundbergs, 1552 Essex, Willow Run, Michigan.

NATURAL semi-transparent wood. Light shines right through it, richly illuminating the lovely grain. Make unusual items that sell on sight. Generous sample $1.00, postpaid. Opaque Woods, Box 1038, Wildwood, Florida.

3,658 GOVERNMENT-owned inventions available to anybody for free use. Details, 25c. Box 122, Allenhurst, New Jersey.

SILICONE—Make and apply invisible masonry water repellent for cinder block, asbestos siding or any porous surface. Sample and instructions $1.00. Printech, Box 384, Princeton, New Jersey.

UP To $10,000 Yearly! New, Exclusive, Mail Order Program! Participation limited. Rush 3c stamp for further details. Pacific Advertisers, Box 4097-W, San Diego 4, California.

START your own profitable home mail-order business! We supply everything! Write today! Studio Products, Box 564-"D," Glendale 5, California.

$15.00 THOUSAND Possible — highest prices compiling mailing lists and addressing from them; longhand, typewriter. Particulars free. Almon Torrey, Rowley, Mass.

$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-36C, Oceanside, California.

EARN $2.00 Hour! I do—making Sandals. Youngs, 1308-PS South First, Arcadia, California.

JOIN "Money Getter's Guild"; get monthly magazine; money making tips; benefits; discounts. 12 months $1.00—Sample 10c. Costar, G.P.O. 972, New York 1.

BUY it wholesale. Manufacturers. Distributors. Over 850,000 items. Literature free. Olsen, 1231-B East Third St., Duluth 5, Minnesota.

BE appointed Notary Public. Details free. Magnolia Press, Box 1272-S, Burbank, Calif.

$46 FROM Square Foot Plywood; Jigsaw necessary. Write: Woodart, Bridgewater, Mass.

MAIL Order Business. Money making opportunity. No inventory. Beverlyhouse, 5460-E Beverly, Los Angeles 22, Calif.

MOLD Making Liquid Rubber; sample pint, with instructions, $2.00 postpaid: Plastercraft Supply Company, 3051 St. Clair Ave., Cleveland 14, Ohio.

SET and sharpen circle saws in minutes without equipment. "Filmtreet" files and hack saws to cut more, reducing cost 300%; year's supply; both $1. Howsman's Hobby, 3503-3 Chestnut, Baltimore 11, Md.

$500,000 BY mail from home. Free Folder. Publicity, Kalamazoo 65EC, Mich.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

38 MONEYMAKING OPPORTUNITIES

SELL Titania gems; $9.75 carat wholesale. More brilliant than Diamonds. Free catalogue. Diamonite, 1404-S Mitchell, Oakland 1, Calif.

SPARETIME Profits Taking Subscriptions, All Magazines. Wholesale Catalog Free. Cassell Agency, Westfield 1, N. J.

DETECTIVES Earn Big Money. Experience unnecessary. Detective Particulars free. Wagoner, P-125 West 86th, N. Y. 24.

MAILORDER—Operate profitable home business using Free Advertising Method reaching millions. Revealing information free. H. G. Seidel, 7070 Hollywood Blvd., Hollywood 28, California.

SCHOOL Seniors—Sell Classmates America's most beautiful Graduation Name Cards. Largest selection. Highest commission. Outsells all others. Free sample kit. Printcraft, Dept P, 1509 Maple St., Scranton 5, Penna.

MAKE Money addressing Envelopes! Our information reveals how. Only 30c. Business, Dept. 45-M, P. O. Box 2224, St. Louis, Missouri.

MAKE Money—At home by mail. Fast, Easy. Liebig Industries, Beaver Dam 2, Wisconsin.

$10,800 PROFITS! Your Own Mailorder Business! No risk! "Success Plan" Free! Treasury, 709 Webster, New Rochelle PS-18, New York.

101 WAYS To Make $1,000 At Home. Details free. Business Surveys, 365 So. Fairfax, Los Angeles 51, California.

MAKE $2600 a Year Spending 5 Hours A Week. Start At Home. New Machine. Small Investment. Free Booklet. A. Z. Co., 442 N. Seneca, Wichita 12, Kansas.

GET Facts—$4.00 merchandise, $2.00 treatise 100 money makers. $6.00 value $2.00. Kahn, 506 West 45th, Chicago 9.

ROSARIES—Make Your Own! For gifts —fun—profit! See complete line of religious goods—gold filled and sterling rosary parts. Medals, books, statues, novelties. Big group of make-it-yourself items. Send 10c for New Wholesale Illustrated Catalogue—just off the press, bigger than ever! Greylock Creations, Box 1048-PS, Pittsfield, Mass.

HOW To Earn Up To $500. for each Script, writing for Television. New, Different! Particulars Free! Wonderful Products. Box 2113-A, Santa Fe, N. M.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

POPULAR SCIENCE OPPORTUNITIES

GET $10.00 by Mail: Keep $8. Terrill. Bogard 2. Mo.

$35 WEEKLY addressing envelopes. Instructions $1 refundable. Adservice. Spring Valley 36. New York.

ALUMINUM awnings baked enamel colors factory prices. Write All Weather Comfort. Box 10254. Tampa. Florida.

TRIM Hair Without "Barber." Miracle clipper sells on sight. Keeps hair neat. Samples sent on trial. Kristee 181. Akron. Ohio.

START A Buying Service. buy wholesale thousands nationally advertised products. Make big profits selling at sizeable discounts. Postcard brings details. American Buyers. 630-8 Linden. Buffalo. N. Y.

OPERATE profitable mailorder business write for details. N. J. Bode. 223 So. Jefferson Ave.. Canonsburg. Pa.

FREE! "301 Profitable Small Businesses!" Amazing shoestring plans! Work Home! Start Sparetime! Deumant Surveys. Kenmore 23-T. New York.

WORK At Home. Typists. longhand addressers. Prepare mailing lists and address literature. Be your own boss. Details free. Suppliers Mailing Service. Stillwater 9. Minnesota.

WIN contest money. General Contest Bulletin gives hundreds of tips. Lists current contests and rules. Sample 25c General Contests. 1609-A East 5th. Duluth. Minnesota.

EARN Money Evenings. copying and duplicating comic cartoons for advertisers. Adservice. Argyle 2. Wisconsin.

YOU can buy wholesale! Save up to 70% on Nationally advertised jewelry. appliances. watches. etc. Free information. Dorinda Enterprises. Box 77. Huntington Station. New York.

DOLLAR Maker "Tips." A gold mine of Information and Knowledge. Contains over 1000 valuable Dollar-Making and Dollar saving "Tips." The book you Need —the book you want. Price $2.00 ppd. Money back if dissatisfied. G. B. Distributors. Box 733. Paintsville. Kentucky.

"YOUR own Mailorder Business." Details free write John Franco. 108-62 53 Avenue. Corona 68. New York.

LEARN professional candy making. profitable home business. Details free. Pate. Kissimmee 2. Florida.

MAKE to $4.50 hour doing common pen lettering. National Artists. 801½-C North Marsalis. Dallas 3. Texas.

BUY Wholesale! Nationally advertised products. Tremendous discounts. Particulars free. Econ-O-Mart. Box 535A. Morristown. New Jersey.

MILLIONS For Small Businessmen. Large list. $1.00. Proven Enterprises. 334 S. Wabash. Rm. 1. Chicago 4. Ill.

BUY Wholesale thousands nationally advertised products. Save money! Make Money! Postcard brings details. Kemah Company. 5017-F Washington. Houston. Texas.

EARN $50-$100 Weekly operating home mail business. We show you how. Write Lewis Bartlett. Richland. Georgia.

OWN. Operate. Route—"Wishing Wells." Place these New $8.50 Skill Games on counters in Cafes. Clubs. Luncheonettes. etc.—collect coins weekly. Details Free! "Legalchero." Box 929. Long Beach 1. Calif.

WEEKLY extra income mailing circulars for advertisers. Complete instructions 25c. Enterprise. 21-D Sanford. Boston 26. Mass.

FREE! Complete Mailorder Business! Terrific Profits! No investment. Write today. Vita-Mins. 2908-PS. Beverly Boulevard. Los Angeles 57.

AMAZING process permanently seals snapshots. cards. etc. in plastic. Earn extra money taking orders. Send 60c and two snapshots for sample work and particulars. Refundable first order. Variety Sales. Box 11533-P. Los Angeles 48. Calif.

EARN Money Sparetime. Homework. Free Literature. Wiese. 1516 Franklin. Waterloo. Iowa.

WE Pay Cash for Boxtops. Labels. Wrappers. Coupons. Bottle Caps. etc!! Particulars free. Boxtops. PS-983-E Main. Columbus 5. Ohio.

WANTED: Typewriter owners. Make handsome profits. Write today. Groves Company. 682 Hastings 3. Nebraska.

MAKE Seashell Salt-Peppers. Pitchers. Slippers. Vases. Ashtrays. We furnish material & instructions. Lastufka Products. Box 10248. Tampa. Florida.

MANUFACTURE Rhinestone and Pearl Jewelry at home. Latest creations. tremendous profits. no skill needed. Postcard brings illustrated catalog of settings. stones. etc. A. V. Cutt Co.. Inc.. 210-H Fifth Ave.. New York 10. New York.

BE appointed. outfitted. Notary Public. Thousands needed. Men. Women. World's lowest cost. Box 3025. Dallas 2. Texas.

400 RADIO Stations active. Free radio advertising. Pay commission only on orders received. Free information. Mishek. Waseca 1. Minnesota.

FREE Book "505 Odd Successful Businesses." Work Home! Expect something Odd! Pacific-35C. Oceanside. Calif.

MEN-Women: If you are interested in addressing advertising literature for national firm. rush 3c stamp for further information. Advertisers Service. Box 4097-PS. San Diego 4. California.

TO $35.00 Weekly. Upholstering spare time. Instructions $1.00. Custom Upholstering. Oxford 2. Penna.

$$$ IN Personalized Baby Record Books. Sell By Mail Use Same Literature We Do. No-Co-Ro. Oakland 6-P. Calif.

EARN extra cash addressing envelopes. Send stamped envelope to Professional Mail Order Survey. Box 1428. Mobile. Ala.

MAKE money by mail! I do. Information $1. Remson. 158-10A Sanford Ave.. Flushing 58. New York.

$500.000 BY mail from home. Free Folder. Publicity. Kalamazoo 65EB. Mich.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00. you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly. Classified Adv. Mgr.. Dept. 1253. Popular Science Monthly. 353 Fourth Ave.. New York 10. N. Y.

39 FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Latest products. Literature free. Kemico. Park Ridge 15. Ill.

500 MONEY Making Formulas. 25c Postpaid. Allen. Dept. PSC. Clinton. Missouri.

ART work. Plaster casting. marble-like hardness. Also washable. Formula $1.00. E. McLean. Scotsguard. Sask.. Canada.

REAL Manufacturing Formulas Lists Free. Cumming. Chemist. Gordon Avenue. Syracuse 4. New York.

FREE Formula Catalog. Anything analyzed $35.00. Western Chemical. Salem. Ore.

OUR laboratory tested formulas and know-how put you in business. Free information. write Stark Co.. Grafton. Wisc.

ANY Formula $3.00. Chemical Instruction Sheet—catalog 10c. J. Belfort. 216 W. Jackson. Chicago 6.

LABORATORY Tested Formulas. Catalog free. Pont Chemical Company. Terre Haute 1. Indiana.

40 PLASTICS

PLASTICS home-craft course for Men and Women. Tells and shows how to make hundreds of fast selling plastics products. All plastics and materials for 33 projects included in course. No special tools needed. Course pays for itself. Write for Free booklet. Interstate Training Service. Dept. D2-N. Portland 13. Oregon.

NEW liquid casting plastic. Clear colors. Embed flowers. insects. coins. Saw. drill. carve. Send 25c for Castolite Creations Manual and proved Success Plan showing how to make money at home. Castolite. Dept. P-102. Woodstock. Ill.

PLEXIGLAS. Lucite. Any size sheets. Square foot (12x12) cost. 1/16" $1.18; ⅛", $1.55; 3/16", $1.90; ¼", $2.25. Add 15% for postage. Minimum order $3.00. Almac Plastics. 600 Broadway. New York City.

LEARN Plastics at home. Complete course—$5.98 postpaid. Dime brings sample plastic. three experiments. full details. Plastic Projects. Box 5151. Detroit 35. Mich.

PLEXIGLAS sheets—cut to size—clear. all thicknesses—standard outdoor translucent colors. McClarin Plastics. P.O. Box 168B. Hanover. Pa.

"INTERNAL Carving of Plastic's" illustrated manual catalog. internally carved brooch. complete $2.00 postpaid. Plastic's. Box 1812. Salt Lake City 10. Utah.

PLASTIC Sheets. Rods. Tubes; etc. Free List. Plastic Supply Co.. 2901 N. Grand Blvd.. St. Louis 7. Mo.

PLASTICS—Cements—Dyes—Findings—Carvings. Wholesale prices. 64 page catalog free. "Trace & Carve" pattern book for carving and coloring fish. birds. animals. only 35c. Taylor & Art. Inc.. 1710 East 12th St.. Oakland 6. California.

FIBERGLAS. Polyester. Plexiglas. Acetate. Vinylite; Casting. coating plastics; My own Fiberglas "How" book now ready —$2.50. Fast service. best prices. Catalog —10c. Airmailed—35c. Gem-O'-Lite. Box 6868P. North Hollywood. California.

UNUSUAL Christmas decorative materials fill our complete catalogue. Van Horn Plastics. 1905 Ingersoll. Des Moines. Iowa.

41 CHEMICALS & APPARATUS

SPECTROSCOPE for quick chemical analysis $3.00. Cutting Sons. Los Altos. California.

NEW Idea Chemical and Apparatus Outfits for Home Experimenting Photo-Scales. Microscopes. Chemicals. Biological and Laboratory. Supplies in Small Quantities. Catalog 25c. Established 1931. John H. Winn. 124-B West 23rd Street. New York. N. Y.

ILLUSTRATED Catalog: Chemistry. mineralogy. biology 20c. Tracey Laboratories. Evanston. Illinois.

CHEMICALS and apparatus for industrial. analytical and private laboratories. Catalog 25c. Dept. M-26. Biological Supply Co.. 1176 Mt. Hope Ave.. Rochester 20. N. Y.

CHEMISTRY: Brand new. step-by-step. A painstakingly designed course for all ages. Not a toy. Not a plaything. Cultural. Practical. Fascinating. Constructive. First lesson 25c. Parkway Laboratory. 1004c Second Ave.. Pittsburgh 19. Pa.

AMAZING New Book of Science. Experiments. Formulas and catalogue of Laboratory Supplies. Only 25c. National Scientific Co.. Dept. 15. 2204 W. North Ave.. Chicago 47. Illinois.

42 HELP WANTED

FOREIGN Employment Construction Work. If interested in foreign projects with high pay. write Foreign Service Bureau. (Dept. P.S.). Metuchen. New Jersey.

FOREIGN & Latin American Employment 1953 "Foreign Service Directory" gives Up-To-Minute Facts on Military & Civilian Construction. Government Jobs. Major Oil Listings. Aviation. Transportation. Steamship Lines. Mining. Importers. Exporters. How-When-Where to apply application forms. Hot List Firms Hiring. $1.00 postpaid. Global Reports. Box 883-S. Hollywood 28. Calif.

ADDRESS advertising postcards. Must have good handwriting. Lindo. Watertown. Mass.

ALASKA Directory—Jobs. High Wages. Labor $2.95 hr. Plumbers $4.00. Carpenters $3.34. Truck Drivers $3.37. etc. Homestead facts. Job List. Application Blank with Directory. $1.00 post paid. "Foreign Opportunity Directory". Foreign Job List. $1.00 postpaid. COD—$1.87. Air Mail $2.00. Specify Listing. Alaskan Directory. Waseca. Minn.

CONSTRUCTION Jobs: Monthly listings. $1.00. Construction Employment Service. 1017 Federal Ave.. Zanesville. O.

CONFIDENTIAL reports. Highest paying jobs in 28 countries. including U.S. Alaska. South America. Europe. Middle East. Many average $1450.00 monthly. Skilled. unskilled. laborers. trades. supervisory. clerical wanted. Only $2 including one year registration-advisory service. Satisfaction guaranteed. National Services. Box 2954SB. St. Louis 17. Missouri.

POPULAR SCIENCE OPPORTUNITIES

FOREIGN Job News and Domestic. Send $1.00 for World Wide Construction Projects, How-When-Where to apply. Global Reports Monthly, Box 883-Sx, Hollywood 28, Calif.

ALASKA!! Last American Frontier. $1.00 brings 1953 Business Directory & Government Map, Military & Civilian Construction; Homestead & Highway facts; Mining, Aviation, Fur Farming, Grazing Timber, Travel directions, List of firms hiring, How to apply. Alaska Opportunist, Box 92-S, Hollywood 28, Calif.

JOBS on ships and yachts, excellent pay. Foreign Travel. Davenport's, Dept. 4, Box 1354, GPO, New York 1, N. Y.

FOREIGN & Domestic Jobs. Up to $12,000. Alaska, So. America, Central America, Far East, U.S. Where-How-to apply. Latest listings world-wide jobs, red hot. "Foreign Opportunity Directory" gives civilian & defense construction, oil companies, aviation, transportation, mining, steamship companies, employment agencies—all kinds of workers needed. Application blank included with Directory $1.00 post paid (COD $1.87) Air Mail $2.00. Alaska Special Job List $1.00 postpaid. Specify Listing. Foreign Opportunities, Waseca, (PS1), Minn.

CREDIT Correspondents wanted. Work furnished. Small investment. Very profitable. Write National Correspondent Service, 1754 Van Buren Ave., St. Paul 4, Minnesota.

JOBS—Foreign and Domestic, skilled, unskilled, clerical, etc. Highest pay. Free information or send $1.00 for complete details. Job Application Service, P. O. Box 1022B, Baton Rouge 1, Louisiana.

$1300 MONTHLY for truck drivers. $1400.00 monthly for carpenters, electricians, plumbers, mechanics. $1200.00 for clerks and laborers. Replacement hiring now being done. Full information and complete foreign listings, with current information on Spain job, $1.00. Women's listings, $1.00. 25,000 men and women needed for new stateside project! Complete information and other domestic listings, $1.00. Dept. 4-L, Opportunities Unlimited, 1110 Commerce Bldg., St. Paul, Minn.

WORLD Wide Employment; Want to travel? Big pay, Transportation free. Most trades available; Monthly listings, oil, construction government, aviation, steamship, manufacturing, and many more. Positions available in most foreign countries. How to apply, application forms, contracts, etc. $1.00. World Wide Employment Service, 1017 Federal Ave., Zanesville, Ohio.

MEN Earn $1,500.00 per month on Foreign projects. (See Reader's Digest December 1952 issue, page 21) Men Wanted now on Foreign, Latin America and Far North projects. Truck Drivers, $3.55 hour. Clerks, $3.00 hour. Electricians, $4.00 hour. Carpenters, $3.70 hour. Laborers, $3.00 hour. Most all trades wanted. Up to 70 hour week with time and one half for all over 40 hours. Transportation paid. 8 to 24 month contract. New treaty with Spain, South Korea will start new bases at once. Get in on start. Full information of over 20 sheets $9\frac{1}{2}$ x 11 listing over 200 firms now hiring, conditions, wages, hours, contract requirements, application form, etc.; also latest issue of our monthly Bulletin listing new contracts and coupon worth $1.00 on subscription. All for $1.00. Airmail $1.24. Edward O. Burns, 911 N. Lancaster Avenue, Department 30, Dallas, Texas.

KANSAS City Want ads mailed. 50c per classification. Kithcart, 2630 Charlotte, Kansas City, Mo.

FOREIGN & Alaska Latest List Contractors openings. $1. Quinn, 1218 South Clayton, Denver, Colorado.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

GOLDEN California—Men needed. Thousands of openings. Jobs to $5,000.00 year unskilled. $8,000.00 year skilled. Act Now! Send $1.00; California Job Opportunities, Box 870-J, Los Angeles 53, California.

HONOLULU Help Wanted columns airmailed $1.00. Pomeroy's, #3 Campbell Block, Honolulu, Hawaii.

42A EMPLOYMENT SERVICES

FOREIGN Jobs. Contracts underway and soon starting in Africa, South America, Canada, England, Europe, South Pacific, Middle East, Mexico and Alaska. Send $1.00 for foreign job news, information, application forms, etc. DCS Foreign Job News, Dept. 268-NX, Bridgeport, Ill.

OVERSEAS Jobs. Big pay, transportation expenses. Clerical, professional, mechanical workers. Most all trades. Latest listings, airline, construction, manufacturing, oil, steamship companies, government agencies, many other opportunities. Up to date information on securing employment, contracts, income tax, application forms, $1.00. Overseas Jobs, Box 335-B16, Baton Rouge, La.

CONSTRUCTION Job List. Published Monthly. $1.00. Dempster's Construction Scout News, Dept. 268-NW, Bridgeport, Ill.

43 AGENTS WANTED

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity 28 E. Jackson, Dept. 18, Chicago 4, Illinois.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 431-E North Clark, Chicago.

ABSOLUTELY Free—Sales Kit. Yours for the asking. Send postcard today requesting kit showing new line, belt buckles with your name or personal initials, cap badges, choice 3000 different emblems. Write Hook-Fast, Box 1425PS, Providence, R. I.

START Your Own Business on credit. Your own boss. 1658 of our Dealers sold $5,000 to $27,500 in 1952. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleighs, Dept. L-U-PSC, Freeport, Ill.

BIG Money making opportunity. Exclusive line work uniforms, Jackets, pants, shirts, coveralls. Advertising embroidered. Every business prospect. Outfit Free. Master Div., Dept. 725, Ligonier, Indiana.

MAKE Christmas Money At Home . . . Take renewals and subscriptions for all magazines. Big Christmas profits now. Liberal Commissions. Everything furnished. Free Catalog. Write McGregor Magazine Agency, Dept. 510A, Mount Morris, Illinois.

MAN to earn $150 and up per week. Long needed invention. Advertised worldwide. Prospects are everywhere. Full or part time. Exclusive. No investment. Free samples. Write Red Comet, Inc., Dept. 392-G, Littleton, Colorado.

BUY Wholesale—25,000 items—Catalog 25c. Matthews, 1472-A3 Broadway, New York City 36.

101 WAYS To Make $1,000 At Home. Details free. Business Surveys, 365 So. Fairfax, Los Angeles 50, California.

BUY wholesale and save 50% on big name merchandise. Xmas Gifts. Make big profits selling your friends or for your own use. Our 1953 Catalog is ready. Rake 607-PS Spring Garden, Philadelphia, Pa.

WHERE To Buy 800,000 Articles Direct from manufacturers at wholesale prices. Save up to 50% on nationally advertised merchandise. Rush $1.00 for big 52 page book. Glass Publishing Company, Ellwood City, Pa.

"FOG-Stop" Windshield Cloth. Instantly removes blurry Mist, Frost, Sleet, Snow. Stops windshield fogging. Samples sent on trial. Kristee 124, Akron, Ohio.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

STRANGE "Dry" Window Cleaner. Sells like wild. Replaces messy rags, liquids. Simply glide over glass. Samples sent on trial. Kristee 126, Akron, Ohio.

GOLD or Silver letters, numbers. Windows, Doors, Trucks. 1" to 6". 500% Profits—Free Samples. Atlas, 544-U West 79th, Chicago 20.

HAIR growth Factor Discovery. Inventor. Pasyk Co., PS-12, Toledo 8, Ohio.

$200.00 WEEKLY! Million Prospects! Details free! Sycamore, Box 13-PS, Oak Park, Illinois.

BUY Wholesale thousands nationally advertised products at big discounts. Free "Wholesale Plan." American Buyers, 629-S Linden, Buffalo, New York.

BIG Profits In Spare Time! I'll send Free Assortment Full-Size Samples fine Foods, Household Necessities to ambitious Men - Women who need money. Friends, neighbors buy eagerly. Send no money. Just write Blair, Dept. 55LY, Lynchburg Va.

CALENDARS. Advertising Novelties. Matches. All styles, including Religious. Varnished, 12 sheet. Girls. Hundreds of Advertising Novelties, Book Matches, etc. Fleming Calendar Co., Promotional Division, 6539 Cottage Grove, Chicago 37, Ill.

IS $210 a week worth a postcard to you? Then rush card with name and address for special Free Trial Plan that sells amazing new Automatic Refrigerator Defroster "like hot cakes!" Write to Mr. Lewis, D-Frost-O-Matic Corp., Dept. J-103, 173 W. Madison, Chicago 2, Ill.

FREE hosiery! Introduce sensational hosiery by giving every man and woman free trial pair to prove how good they are! Amazing nylon stockings guaranteed against runs and snags. New miracle one-size nylon two-way stretch socks. Contain no elastic yet fit any size foot. Never sag. Comfortable like second skin. Actually guaranteed one full year. Earn to $3 hour in spare time. Mail postcard for free sample stocking and money-making outfits. Absolutely no obligation. Kendex, Babylon #4, New York.

LIFETIME vitamin business! Sell sensational Food supplement! Regular $3.00 size (month's supply) $1.50 postpaid. Money Back Guarantee. National Health Products, Dept. PS2, 150 Broadway, New York 38.

BALL Pens $10.00 Gross. D.E. S.E. Blades $4.75M. YoYo Tops $12.00 Gross. Lutzker, 871 East 170th, New York City 59.

MAKE Money Introducing World's cutest children's dresses. Big selection, adorable styles. Low prices. Complete display free. Rush name. Harford, Dept. L-1341, Cincinnati 25, Ohio.

BUY direct from factory wet and dry mops, wringers fibre brooms, etc. Catalogue free. Hamm Broom Co., McSherrystown, Penna.

MAKE Extra Money. Sell front door name plates to friends, neighbors. Retail $1.98—you make $1.00! Free selling kit. Modern Engraving Co., P.O. Box 194, Boston 14, Mass.

BIG profits selling ties ($2.00 values) $6.50 dozen. Free catalog. Empire Cravats, 611 Broadway, New York 12.

WHOLESALE catalog! Nationally Advertised Merchandise. Pette Co., 1554-PS W. 11 Street, Brooklyn 4, New York.

CALIFORNIA sweet smelling beads, sensational sellers. Particulars free. Mission, 2324P West Pico, Los Angeles 6, Calif.

BUY Wholesale thousands nationally advertised products. Save money! Make Money! Postcard brings details. Kemah Company, 5017-G Washington, Houston, Texas.

SCHOOL Seniors—Have Fun and Spending Money!!! Be Popular With Your Classmates. Send Postal For Details. Craftcards, Box 235-M, Pittsburgh 19, Penna.

AFRICAN Exports Save 50%. Leather goods. Send $3.00 for sample and literature. Drown, B.P.O. Box 302, Tanger, Morocco.

"FREE Razor Blade"—wanted 10,000 men to try our blades. Send for free sample, no obligation. Distributors—Wanted. Mailomatic Service, 26 Court Street, Brooklyn 1PS, New York.

POPULAR SCIENCE OPPORTUNITIES

DAY-GLO Daylight-Fluorescent Signs. Retail $1.00 each. Three samples $1.00. Edward Cook, 51 Martin Avenue, Saratoga Springs, New York.

RURAL Agents. 20" wood-chain saw. Cuts everything. Winter demand. Easy terms. Farmco-PS, Excelsior Springs, Mo.

MEXICAN Feather Pictures. Sell on sight; 200% profit! Free details. Sample 20c stamps. (No Coins). Sylvias, Apartado 9036, Mexico City.

EASY handwork makes fast-selling useful articles. Sample free. Sunmade Company, Brockton 64, Mass.

DIAMOND Distributor Agents wanted by Diamond manufacturers to resell in franchised territory. Diamond guarantee furnished with all rings as well as literature and advertising mats. Send for one or more of the following samples. Gents or ladies diamond rings or sets. Retail price —$149.95, $299.95, $450.00, $600.00. Dealers price—$63.50, $126.75, $178.50, $240.00. Jobbers price—$57.25, $114.50, $163.50, $220.00. As a distributor you can make almost 200% profit selling these same products for—$50.00, $100.00, $150.00, $200.00. Write at once to Diamond Enterprises, 740 McKean Avenue, Donora 3, Pa.

"GENUINE Silverplating Polish", (Cloth rub on.) $1.50. NuSilver, 508-PS12, Aurora, Illinois.

FREE book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-38C, Oceanside, Calif.

$1.00 PROFIT selling $2.95 photo enlargement offer. Allen Studio, Riegler Bldg., Little Rock, Arkansas.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

44 HIGH-GRADE SALESMEN

ADVERTISING book matches—Cash in on big demand—sell Union label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-1253, 7530 Greenwood, Chicago.

EXCLUSIVE illustrated mailing card advertising automotive and other lines. Our 69th year. Commission basis. Immediate earnings. Permanent. State qualifications. American Publ. and Engr. Co., 79 Madison Ave., New York City.

AD Matches! Sell Amazing Designs—20, 30, 40 and 240-light book matches. Biggest spot cash commission; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part time. Buy Nothing! Sales kit furnished. Match Corp., Dept. PS-48, Chicago 32, Illinois.

45 EDUCATIONAL & INSTRUCTION

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

HIGH School—No Classes. Study at home. Spare time. Diploma awarded. Write for Free catalog. HBA-31, Wayne School, 2527 N. Sheffield, Chicago 14, Ill.

BOOKKEEPERS! Increase your earnings: Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203-N, Cedar Grove, North Carolina.

BE a Real Estate Broker. Study at home or in classroom in leading cities. Write for Free Book today. "G.I. Approved." Weaver School of Real Estate, 301 Law Bldg., Kansas City, Mo.

LEARN Drafting—Fastest method. Low cost pay-as-you-learn plan. Drafting equipment furnished. Top grade industrial instructors. Free Catalog. Cesco Industrial Training Services, 1704-B Frederick, Fort Worth 7, Texas.

WANT A Diesel Job? New Opportunities to increase income. Higher Pay. More Money. We can help you Qualify. Tools. Shop method home training. Write today! Diesel Tractor, Heavy Equipment Division, Interstate Training Service, Dept. B2-N, Portland 13, Oregon.

COMPLETE Your High School at home in spare time with 56-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. X946, Drexel at 58th, Chicago 37, Ill.

INCREDIBLE! Become Mental Superman Overnight! Free Booklet! Bijou, Box 1727-VC, Hollywood 28, California.

FOR an extremely profitable lifetime business, operate a Collection Agency. Quickly learned. Write Cole Associates, Syracuse 2, New York.

MINISTER'S—laymen's religious courses. Free Bulletin! Midwestern Schools, 517 Merchants Bank Building, Indianapolis, Ind.

LIGHTNING Calculation—number magic —short cuts. Increase efficiency, amaze friends. Send $1.00 for sample lesson. Information free. Box 931, Del Mar, Calif.

HIGH School Diploma at home. Licensed teachers. Approved textbooks and all materials furnished. Southern States Academy, Box 144, PX, Station E, Atlanta, Georgia.

WINDOW Display money making home course. Pan-America Art School, 321 West 56th Street, New York 19.

BECOME a Doctor of Psychology or Metaphysics. Learn secret of contentment, happiness. Win degree of PsD. or MsD. Solve mental worries. Free book. College of Universal Truth, 5038-K Broadway, Chicago.

MEDICAL Laboratory Technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-B, Austin, Texas.

OWN A Collection Agency. Big Money! Free booklet. Franklin Credit, Roanoke 7, Virginia.

POPULAR Piano. Rapid Course. Young Studios, 7051 Middlepointe, Dearborn, Mich.

EARN While You Learn Auto And Diesel Mechanics. Master this top paying trade. Many graduates earn $100 a week and up. Approved for Korean veterans. For free information write Dept. No. 262, Nashville Auto-Diesel College, Nashville 3, Tenn.

STUDY for Degree of Doctor of Psychology (Ps.D.), Doctor of Metaphysics (Ms.D.), or Doctor of Divinity (D.D.) Write College of Divine Metaphysics, Dept. P-S, 2811 North Illinois Street, Indianapolis, Indiana.

EDUCATIONAL books used correspondence courses bought, sold, rented, catalog free. Willard Bayles, 211 Essex, Hackensack, New Jersey.

WELDING training pays at Hobart Welding School. Box P-1231, Troy, Ohio. VA Contract. Best equipment. Catalog Free.

SIMPLIFIED method teaches algebra instantly. $1; guaranteed. Ziemben, 6123 Orchard, Dearborn, Michigan.

FREE home study course in basic economics, offered as a public service. Recommended by many leaders. Send postcard for complete information. Henry George School, Dept. P, 50 E. 69th Street, New York 21, New York.

WORK For "Uncle Sam"! Start high as $316.00 month. Men-Women, 18-55. Qualify Now! 30,000 jobs open. Experience often unnecessary. Get Free 36-page book showing jobs, salaries, requirements, sample tests. Write: Franklin Institute, Dept. H-22, Rochester, New York.

PIANO Tuning Pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—55th year. G. I. Approved. Write for booklet. Niles Bryant School, 77 Bryant Bldg., Washington 16, D. C.

"CHINESE Know-How" teaches you miraculous techniques to personal power, profitable living. Amaze yourself! Be a winner! Send $1.00. Institute of Functional Research, Box 4866, Washington 8, D. C.

SEND for Autogram. New pastime for mechanical minded. 50c postpaid. Autograph Press, Dallas 22, Texas.

USED Correspondence Courses and Educational Books Bought, Sold, Rented. Catalog Free. Educational Exchange, Summerville, Georgia.

LEARN Drafting and design at home. Simplified method. Text books and complete drafting equipment furnished. Free booklet. Roth Technical Institute, Dept. S12, Box 2283, Youngstown, Ohio.

M.I.T. Graduate, former M.I.T. instructor, offers courses in mathematics, physics, drafting, blueprint reading. Write: Technical Instruction by Correspondence, Box 69, Cambridge 39, Mass.

CORRESPONDENCE courses, educational books, bought, sold, rented, exchanged. Reasonable. Lists free. Magnolia Press, Box 1272-S, Burbank, Calif.

YOU, Too, may become successful. You need not fall flat on your face under handicaps or stand paralyzed before golden opportunities. Tap unused personal powers with our "Human Behaviour Control" home study formula. Rush your request for free details. Personal Psychology School, Box 1924-S, Louisville 1, Kentucky.

RECOGNIZED College Degrees through Home Study. Tahoe Colleges, 510 W. Pueblo, Reno, Nevada.

46 CONTESTS

CONTESTING provides fabulous home income for thousands. Qualify your entries through the original New York service project. Enclose stamp. National Contest Bulletin, Box 2685-PS, Miami 16, Fla.

WIN Big Cash Prizes! Mutual Contest Bulletin gives many tips. Lists current contests, rules, etc. Sample 25c. Mutual Contests, PS-983-E, Main, Columbus 5, Ohio.

WHEN you need contest help, Write Contests, 13 Earl, Red Bank, New Jersey.

47 DETECTIVES

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

DETECTIVE Training. Phillips Secret Service System, 1917-C North Kenneth, Chicago 39, Ill.

SECRET Service, fingerprint training at home, in spare time. Write, Associated Special Investigators, Box 434, Saint John, N.B., Canada.

48 LANGUAGE OUTFITS

IT'S Fun learning a language by Linguaphone. At home, in leisure time, quickly, easily, master French, Spanish, German, Russian, Japanese—29 languages by Linguaphone Conversational Method. Save time, work, money. Send for Free Book. Linguaphone Institute, 5412 Mezz., Rockefeller Plaza, New York 20.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

WOMEN Mail Buyers List. $5.00 thousand. Lakeland Sales, Butler, New Jersey.

MAILING lists. All types. $5.00—1000. Melody Mailers, 8031 Biscayne, Miami, Fla.

MAILING Lists. All kinds 1000 $5.00. Dixie Service, King, North Carolina.

NAME Lists! Nationwide. Bulletins Free. Mailtrader, Box 643, Ann Arbor, Michigan.

DOLLARS in the mail for you! Put your ad here and watch orders fill your mailbox. For as little as $8.00, you can advertise your product or service in the classified opportunities columns of Popular Science Monthly. The February issue closes on December 22nd. Write today for order blank and free copy of booklet "How To Make Money Out Of Classified Advertising". O. K. Kelly, Classified Adv. Mgr., Dept. 1253, Popular Science Monthly, 353 Fourth Ave., New York 10, N. Y.

51 SPECIAL SERVICES

LETTERS Air Mailed From Old Mexico. Mexico City — Guadalajara — Mazatlan — Guaymas—Hermosillo $1.00. Postcard 50c. A. Espejo, Box 217, Tijuana, Mexico.

VOCATIONAL Analysis by Mail. Write Personology Foundation, 1001 N. Vermont, Hollywood, California.

BIBLE questions answered free. Jon. Ferguson, 116-14 141 Street, South Ozone Park 36, New York.

POPULAR SCIENCE OPPORTUNITIES

52 AUTHORS SERVICE

NO luck finding a book publisher? Write for Free Booklet PS. Vantage Press, 120 West 31st, New York.

BEGINNING Writers: Get $1 to $20 checks daily writing simple children's stories, articles, poetry in your sparetime. Experience unnecessary. Our instructions reveal how. Details Free. W. Herman, 2016 Euclid, Cleveland 3, Ohio.

53 ADVERTISING

ADVERTISE: 24 words, 100 Canadian Newspapers $5.50 Lists Free. Advertising Bureau, 10511-P Springfield, Chicago 43.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

500 RADIO Stations which accept advertising on commission and 200 Magazines which give Free publicity. Including instructions "How"—$2.00. Satisfaction guaranteed. Brass, Box 1664-PS-3, Chicago 90.

GET Thousands of Dollars worth of National Advertising for your new product, for only a few dollars. Williams Agcy., 1117-B-2 Investment Bldg., Pittsburgh 22, Pa.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 1912C, Pleasant Hill, Ohio.

CARTOONISTS: Amateur, Professional. Prepare for Animation with Max Fleischer's plan. Write Vera Coleman, 60 East 42nd Street, New York, N. Y.

BIG income painting signs. No expensive course. Old Timer, 257 Maple, North Hills, Penna.

CARTOON Fun. Self-Teaching Outfit. $1.00 complete. Selumart, Box 29, New York 72, N. Y.

CHALK Talks. Laugh Producing Program. $1.00. Illustrated Catalog 10c. Cartoonist Baida, Oshkosh, Wisconsin.

55 TYPEWRITERS & OFFICE MACHINES

TYPEWRITERS. Printing Devices, Office Machines, supplies, appliances. Dixie Graph, King, North Carolina.

VARITYPERS, IBM electric $100. Sachs, 119 W. 23rd (PS), New York.

TYPEWRITERS $22.50 up. Adders $12.95. Meier's, 118 Spruce, Wichita 7, Kan.

SPECIAL! New and Reconditioned Typewriter Bargains. "Typewriter Wholesalers", Basking Ridge, N. J.

56 RUBBER STAMPS & OFFICE SUPPLIES

THREE Line Rubber Stamp, $1.00! Morey's, Box 94, Redwood City 2, Calif.

3 LINES, $1.00. Fast Service! Catalogue. Johnson Press, Box 6-B, N.Y.C. 26.

57 PRINTING, MULTIGRAPHING, ETC.

SALESBOOKS, Labels, Calendars. Samples for 50c. Write, O'Tool, Hammondsville, Ohio.

100 8½x11 LETTERHEADS, 100 6¾ Envelopes, $2.00, 250 each, $3.75. 500 Business cards $1.95. 1,000, $2.50. Standard copy. Postpaid. Allen, Dept. PSP, Clinton, Missouri.

BUSINESS, Personal Printing. Catalogs Free. Howprint, 723-S Eunice, Webster Groves 19, Missouri.

BUSINESS cards samples, prices free. Malmart, 1776 79 Street, Brooklyn 14, N.Y.

MIMEOGRAPHING, mailing. Quality—fast service. Mimeographers, 7404-58, Summit, Illinois.

BUSINESS Personal stationery. Catalog free. McIlvaine, Box 86-PS, Brooklyn 30, New York.

BUSINESS printing. Samples. Homestead Press, 2718-S East 58th Street, Huntington Park, Calif.

TWO color 8½x11 letterheads, 500—$3.50. Samples. D'Yarmett Service, Newark, Ohio.

58 PRINTING OUTFITS, SUPPLIES

DO your own printing. Save money. Simple rules. We supply everything. Print for others; good profit. Raised printing like engraving, too. Have home shop. Details free. Kelsey Presses, V-8, Meriden, Conn.

MAKE your own, self-molding, rubber printing cuts. Plexirubber, Argyle 2, Wisc.

CAST your cuts. Rubber Stamps. Catalog Presses, Supplies, Paper, 10c. Custom. Box 211-S, Springfield, Missouri.

PRINTING toy—real printer's metal type. Two colors of ink, Rollers, etc. $4.00. Bogin, 2611 West Second St., Brooklyn 23, New York.

59 PATENT ATTORNEYS

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS. For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, N. Y.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTORS—Send today for booklet "Patent Protection for Inventors" giving detailed patent information and preliminary steps to take toward patent protection, also "Evidence of Invention" form. Victor J. Evans & Co., 841-P Merlin Building, Washington 6, D.C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 32B-K District National Building, Washington, D. C.

REGISTERED Patent Attorney offers services. Sanders, 6430 Evans, Chicago 37, Illinois.

"INVENTOR'S Guide" free. Frank B. Ledermann, Registered Patent Attorney, 154 Nassau Street, New York.

INVENTORS—If you believe that you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-W Victor Building, Washington 1, D.C.

PATENTS—Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers, Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

60 FOR INVENTORS

INVENTORS, if you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 631-E St., N.W., Washington 4, D. C.

INVENTORS. For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, N. Y.

CASH For your ideas. 280 Manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

INVENTIONS Promoted. Patented or Unpatented. Established 1911. Write Adam Fisher Company, 183 Enright, St. Louis, Mo.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS—If you consider your invention to be something of importance, take steps to protect it with a United States Patent which gives you the right to exclude others from making, using and selling your invention as claimed. "Patent Protection for Inventors" outlines steps to take to secure patent protection. Mailed promptly without obligation. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 842-P Merlin Building, Washington 6, D. C.

INVENTORS—Send for free patent information book and inventor's record. Registered Patent Attorney, Associate Examiner, Patent Office 1922-1929; Patent Attorney & Advisor, Navy Department 1930-1947. Gustave Miller, 123PSI Warner Building, Washington 4, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 32A-K District National Building, Washington, D. C.

MARKETING assistance. Product development and design. May we serve you? Manufacturers Service, P.O. Box 83, Bloomington, Illinois.

INVENTORS—If you believe that you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-V Victor Building, Washington 1, D.C.

PATENT Searches, $5.00, including patent copies. Same reliable search as conducted for patent attorneys. Free protection forms. 48 hour service. Patent Service Institute, 945-B Pennsylvania Avenue, Washington 4, D.C.

INVENTORS: Develop your invention profitably. Get the "Truth About Patents" $1.00 postpaid. N. W. Halsey, Box 65, Jackson Heights, New York.

FINALLY there is a publication devoted exclusively to describing your ideas and inventions to manufacturers. Rates reasonable. Postal brings details. David B. Lee, Box 142, Hampton, Virginia.

FROM one Inventor to another: Have licensed over 60 of my own inventions. I can help you market yours. Also thorough patent searches and commercial evaluations. Free information. Jacquelin E. Harvey, Jr., Research Engineer, Realty Bldg., Washington 8, D.C.

SEARCHES—Put your patent searches in the hands of a Registered Patent Attorney or Agent as he qualifies to give a worthwhile patentability report. Record of invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 939 Columbian Bldg., Washington 1, D. C.

OBTAIN patents yourself. Eliminate attorneys fees. Information $2.00. Staisfaction or money refunded. D. Davidson, 5645 11th Ave., N.E., Seattle 5, Washington.

INVENTIONS Sold. Leased. Complete Services. M. Joyce Humphries, 1425 Landtitle, Philadelphia 10.

43 THINGS to do before applying for patents. Free information. Fred C. Roth, 657 East 26 St., Brooklyn 10, N. Y.

PATENT Searches $5.00. 48-hour service. Patent Applications prepared. For free Record of Invention write Miss Ann Hastings, P. O. Box 176, Washington 4, D. C.

POPULAR SCIENCE OPPORTUNITIES

PATENT Searches $5.00. 48-hour airmail service. Patent Applications prepared. Invention protection forms free. Write Patent Engineering Service. 711 14th Street, N.W. Washington 5, D. C.

PATENT Searches $5.00. Reports airmailed in 48 hours. Patent Applications prepared. Free Record of Invention. Write Raymond L. Smith, Patent Searcher, 622 Sheraton Building, Washington 5, D. C.

61 INVENTIONS WANTED

INVENTIONS wanted. Patented; unpatented. Tremendous Manufacturers lists. Global Marketing Service 1404 Mitchell, Oakland 1, Calif.

INVENTIONS promoted. Patented or Unpatented. Established 1911. Write Adam Fisher Company, 183 Enright St. Louis Mo.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 30C, 631—E Street, N.W., Washington 4, D. C.

INVENTIONS Wanted. Patented or Patent Pending. 23 years experience Promoting Inventions. National Service Bureau, 2122 Meramec St. Louis 18, Mo.

INVENTIONS Wanted. Patented, unpatented. Send for free form "R." Gilbert Adamec, Patent Broker, 55 West 42 St., N.Y.

CASH Buyers for inventions, patented or patentable. National Inventors Institute, 4007 East 131st St., Cleveland 5, Ohio.

INVENTIONS Wanted. Patented. Pending only. Inventors Patent Exchange, Hartford 1, Conn.

IDEAS, inventions sold. Broker Service, 2408 West Washington, Charleston, W. Va.

62 PATENTS FOR SALE

PATENTED, automatic hair curler, patented hinging chain paper clip for licensing. Thomas M. Cruce, Billings, Montana.

64 MODELS, MODEL SUPPLIES

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 28. Listing hundreds of items. A. J. Fisher, 1002-2 Etowah, Royal Oak, Mich.

1953 CAR Models, 1/25 scale, all metal, chrome trim. Send for catalog. Ajax Toy Co., Dept. PS-12, 2637 W. Division St., Chicago 22.

BUILD Historic ships, vehicles. 50c to $9.00 kits. Illustrated Catalog 10c. Ideal Models, 19 West 18th Street, New York 11.

SHIP and other scale models. Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. Illustrated catalog 25c. James Bliss & Co., Inc., Dept. PS54, 342 Atlantic Ave., Boston 10, Mass.

LIVE Steam Engine, 10½" high, ready-to-run, $5.95 postpaid. Catalog 35c. Merlo Company, 50-18 94th Street, Elmhurst 73, New York.

POWER Models. Unusual steam, gasoline and traction engines, fittings, metals. Anniversary catalog 50c. Charles Cole, Ventura, Calif.

SOMETHING new—Scenic ship models, kits. For framing or shadow box—Carve and paint yourself—photos and description 10c. Richard Orr, Ship Studio, No. Easton, Mass.

BUILD 5,000 piece miniature homes, blueprints and instructions—$2.50. Bennett, 6578 Van Ness, Los Angeles, Calif.

LIVE Steam Locomotive, Atlantic 4-4-2 1-2" Models. 54 page book of drawings covers patterns, core boxes, machine finishing. Both sizes. Accessories too. $15.00 Postpaid. Return priv. 5 days. Robert H. Butler, 4086 Barnes Road, Santa Rosa, Calif.

LIVE steam locomotive catalogue of supplies, rough castings, and blueprints for ten engines. Send 25c to Yankee Shop, Box 275B, Danvers, Mass.

SCALE models of horse drawn vehicles. Buggy $1.95, Surrey $2.50, Carriage $2.95, stage coach $3.50. Add 25c mailing charge. Models, Inc., Mound Valley, Kansas.

STEAM engines, boilers, castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, N. J.

65 HOME CRAFTSMAN

LEATHER, tools, lacing, supplies. Free Catalog. National Handicraft, 199 William St., New York 7.

"PRACTICAL Painting, Wood Finishing" shows how to get professional results. Furniture finishing, workshop projects, home decorating. Complete Modern brush and spray methods. Tricks you've never seen. Write Home Craftsman, 115-F Worth St., N. Y. 13.

93 "ORIGINAL Idea" Jig Saw patterns $1.00. Professional drawing, quality printing. Full size shelves, toys, lawn ornaments, novelties. Walker Studio, V12, 4343 Lindell, St. Louis 8, Mo.

"TOPS" in everything for Leathercraft. Lowest prices. Genuine "Craftool" stamps. Catalog 10c. Crown Leather Company, 22 Spruce Street, New York 38.

PLASTICS home-craft course for Men and Women. Tells and shows how to make hundreds of fast selling plastics products. All plastics and materials for 23 projects included in course. No special tools needed. Course pays for itself. Write for Free booklet. Interstate Trolling Service, Dept. D2-N, Portland 13, Oregon.

LEATHERCRAFT, Metal Tooling, Textile Painting, Beadcraft, Shellcraft. Many other crafts. Send for Free big illustrated catalog today! Kit Kraft, Hollywood 46, Calif.

BIG Savings Leather—Now, for first time you can buy full sides of top grain cowhide at our special amazingly low "tannery-to-you" prices. For details write Dept. 6, W. D. Byron & Sons, Williamsport, Md. Fine cowhide tanners since 1832.

START Your Own business manufacturing driftwood lamps. Kits $7.00. S. Patchett, 2187-N.W. 24 Court, Miami, Florida.

OUR biggest Leather and Craft Catalog yet! 1000's of items. Send 25c (refunded with first order). Russo Handicraft Supplies, Dept. 212, 245 S. Spring, Los Angeles, California.

LEATHERCRAFT Supplies. Pre-cut kits, tools, etc., large stock. Catalog 10c, refunded first order. Whitman Saddle Mfg. Co., 1725 Powers Street, D-12, Cincinnati 23, Ohio.

MAHOGANY Dressed kiln dried Honduras ¼"x5½"x36" (1 lb.) $1.00 ea., ¾"x5½"x36" (3½ lbs.) $1.50 ea. Add Postage. Other sizes available. Herb Baumgartner, Box 2913, Brentwood 17, Mo.

FREE 48 Page Leathercraft Catalog including easy-to-follow instructions on lacing, wallets, etc. Get started in this easy fun-to-do-hobby today. Tandy's leathercraft prices are lowest! Write Tandy Leather, Box 397-S, Tulsa, Okla.

BUY wholesale nationally advertised power hand tools, thousands other products at big discounts. Free "Wholesale Plan." American Buyers, 630-SS Linden, Buffalo 16, New York.

LEATHERCRAFT For Pleasure or Profit. Make easy-to-assemble purses, belts, gloves, woolskin toys, 100 other items for gifts or to sell. Send 10c today for big catalog. Largest Leathercraft Stock in U.S. J. C. Larson Co., 820 S. Tripp, Dept. 3754, Chicago 24.

CRAFT Leathers, Supplies, Lacing, Kits, Tools. Send 25c for latest catalog. Jonas Handicraft Co., 30 Frankfort Street, New York 38, N. Y.

129 NEW full size Jigsaw Patterns. Unusual novelties, gifts, lawn figures up to 22 inches high, action (merry-go-round) windmill, toys, useful gadgets. Artist drawn. $1. Craftplans, 1321-B South Michigan, Chicago 8.

LEATHERCRAFT, New Stylecraft folder Free. New Kits illustrated. Filigree Belts, Billfolds, Purses, etc. Send 25c new catalog. Refunded first order. Apache Leather Co., 2804 East Washington St., Phoenix, Arizona.

89 FULL size Jig Saw patterns of beautiful shelves, ornaments, toys, novelties plus "How, Where to Sell." Only $1.00. Mastercraft 124S, 7041 Olcott, Chicago 31, Ill.

KNOCKDOWN Cedar Chest, Lumber and Veneers. Free Price List. Giles Co., Brownsboro, Alabama.

SQUAREKNOTTERS: Make belts, handbags, lanyards, dog leashes, etc. Special offer! Beginner's book, catalog and quality cord samples 15c. P. C. Herwig Co., Dept. P41, 39 Henry St., Brooklyn 1, New York.

101 FULL size patterns. Smart new gifts, noveities, lawn figures, shelves, action windmills, alphabets. Plus "Make Money Jig Sawing" Only $1.00. Mastercraft 125S, 7041 Olcott, Chicago 31, Illinois.

KNOCKDOWN cedar chest and lumber free price list. Bedford Lumber Company, Shelbyville, Tennessee.

LAMP size cypress knee $1.00. Cy Products, Dept. 5, Lafayette, La.

"FATHERS"—15 Full Size Christmas and Birthday Gift Patterns For Your Young Craftsman To Make. Send 50c. Pride and Joy Company, 214 Dane, Randolph, Wisconsin.

A Selection of the most unique and fascinating Jig Saw patterns; money makers, $1.00. H. Singer, 2128 N. "F" Street, Elwood, Indiana.

100 FULL size jig saw patterns, up to 20" high, only $1.00. Pattern Service, Medway 8, Mass.

EARSCREWBACKS—Pinbacks—dozen 25c, gross $2.00. Deskpens $1.20. Cosmopolitan Metalcrafters, Box 176-PS, New York 8.

LEATHERCRAFTERS: Big illustrated catalog of materials, tools, kits, 10c. Art's Leather, 411 Joseph Ave., Rochester 5, N.Y.

OVER 100 new full size jig saw patterns for lawn figures, toys, novelties, etc. Only $1.00. Free ball pen with each order. Andco Patterns, 1488 South, Toledo, Ohio.

LEATHERCRAFT Tools, Leather Embossing Plates, Craft Accessories, Dies. Catalogue 10c. Louis Jones Engineering Company, 1613 Main, Fort Worth, Texas.

"WE Supply Ready Markets For Your Handicrafts." Big information folio and complete details—25c. Home Arts & Crafts, 310 Davidson Rd., Westby, Wisc.

TRIPLE the life of your Christmas Tree Lites. 25c. Clyde Clymer, Lincoln 4, Neb.

14 ALPHABET Patterns, Monograms—Numerals, ½"-4" high. Walker Studio, PS-A12, 4343 Lindell, St. Louis 8, Missouri.

90 ALL new full size lawn ornament and novelty patterns, up to 20" high. Only $1.00. Mastercraft 122S, 7041 Olcott, Chicago 31, Illinois.

MAKE Your Own Furniture! New 256-page book "How to Build and Repair Your Own Furniture" shows you how to save big money making and repairing tables, chairs, bookcases, desks, cabinets, shelves, much more! Step-by-step directions, hundreds of illustrations. Only $2.49—money-back guarantee. Popular Science, Dept. 1253C, 353 Fourth Avenue, New York 10, N. Y.

66 BUILD IT YOURSELF

BUILD Your Own "Tractor". Free information. Eltraco D-5, Camptonville, Calif.

CLOTHES Dryer—Rotary Drum, Cabinet Type. Plans, instructions, $1.00. Artisan Technicraft, P. O. Box 846, Phoenix, Arizona.

BUILD a Table Model Power Hack-Saw. Cuts patterns in Metal, Plastic, Wood. Plan $1.00. A. Harvey, Thornwood, N. Y.

AUTOMATIC Clothes Dryer. Build yourself $50.00. Complete plans $1.00. Nunley Enterprises, Dept. A., 3390 Wiley, San Leandro, California.

BUILD a treasure and metal detector. Lightweight. Sensitive. Inexpensive. Complete kits. Free Literature. Dept. H. Electronic Applications, Box 4975, Washington 8, D.C.

BUILD Inexpensive Concrete Blockmaker. Motor or Hand. Then Make Blocks for Five Room House for only $95.00. Free Details. Clyde Lee, Mountain View, 1, Oklahoma.

BUILD copyrighted concrete block duplex $1300. Living room, kitchenette, bedroom, bath each side. Blueprint, instructions, material cost list $1.00. Bailey Builders, 915 Pyramid Life Building, Little Rock, Arkansas.

BUILD three bedroom rancher—large rooms—fireplace—only $1200. Plans $1.00. L. Minkoff, Box 52, Flushing, New York.

POPULAR SCIENCE OPPORTUNITIES

SEND for big new 1953 illustrated catalog that will show you how to turn your spare time into cash—making quick-selling, highly profitable lamps. Every home a prospect. Hundreds doing it—you can, too. No experience or special tools required. Catalog No. 7 contains 56 pages filled with shades, shade frames, figurines and bases, oil lamp converters, boring compound and dozens of similar items. Also all kinds of sockets, cords, pipes, harps, finials, bases and hundreds of other parts—everything you need. Special 8-page section shows 6 beautiful lamps in kit form—ready to assemble. You buy wholesale, sell at retail—make Big profits. Send 25c today for new 1953 catalog and wholesale price list—you'll be glad you did. The 25c will be refunded on your first order. Gearon Co., Dept. 500-A12, 28 S. Desplaines, Chicago 6, Illinois.

BUILD luggage and cases at home. We sell your product. No special tools or equipment needed. Free details. Casecraft, 805-Y Sunset Blvd., Los Angeles 12.

"CONCRETE Block Homes." 32-page booklet on how to build. $1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penn.

GARDEN Tractor two—four wheel drive auto parts. Information. Tractor, 14493 Arrow, Fontana, Calif.

CABIN, cottage, hunting lodge, ranch house! Have any one with aid of amazing new book "How To Build Cabins & Ranch Houses"! 256 pages, 207 pictures, 17 different plans—any one worth more than 3 times the low cost of entire book! If not delighted return book for full refund. Send only $2.49 to Popular Science, Dept. 1253C, 353 Fourth Avenue, New York 10, N. Y.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

RHINESTONES, jewelry settings, cameos, sequins, beads. Send 10c for Illustrated Catalog. J & M Novelties, Dept. CP-4, Griffith, Indiana.

JEWELRY making. Send 20c for illustrated catalog. Milady-Fair Co., G.P.O. 1328, New York City 1.

5000 JEWELRY Styles you can easily make yourself. Rhinestones, Pins, Earrings, etc. Lowest Prices Guaranteed. Instructions and Catalog—10c. Barry's, 166 Ardsley Court, Newark, New Jersey.

TWO New Books show how to make jewelry at home and how to sell what you make. Send 25c for "How To Make Costume Jewelry" and "A Success Plan For You." Castolite, Dept. PJ-102, Woodstock, Illinois.

WATCHES wholesale catalog 10c. Kavanagh, 607 Knickerbocker Ave., Brooklyn 21, New York.

JEWELRY Wholesale direct to you. Elgin, other national brands. 50% discount. Write catalog 10c. Brock-way Plan, 1145 High, Topeka, Kansas.

10 HIGH-grade Swiss Ladies'-gents' Wristwatches needing minor repairs, $18.00. Catalog 10c. Berkowitz, 1150 Castlehill, New York 61.

69 FOR THE HOME

FREE Trial. Send no money. We'll gamble you'll like Magnecatch 140—"the most powerful magnetic catch on the market"—for all cabinet and interior doors. Replace broken friction catches in 10 minutes with only a screwdriver. Ideal for new homes, too—replaces expensive locksets. Alnico lifetime magnet in beautiful crystal-clear housing. Fully guaranteed. Write for postpaid sample; try for 30 days, then remit $1.19 or return to Magnecatch Corporation, 320 North Meridian Street, Indianapolis 4, Indiana.

LANDSCAPE your property, build trellises, arbors, gates, fences, garden screens, outdoor fireplace-barbecue, flagstone walks, beautiful garden furniture, a garden pool, much more! Amazing new "House & Grounds" book even shows how to add a breezeway-carport, terrace, porch or patio! 256 information-packed pages, over 700 pictures. Send only $2.49 to Popular Science, Dept. 1253C, 353 Fourth Avenue, New York 10.

FOAM Rubber Furniture Cushions—Factory Seconds—50% discount. Prices Free. Perma-Foam, 140-A Main Street, East Orange, New Jersey.

CESSPOOLS, septic tanks, outdoor toilets cleaned, deodorized. No pumping digging or moving necessary. Inexpensive. Details. Chemical Cesspool Cleaning Co., Boston 34, Mass.

70 OF INTEREST TO WOMEN

NYLONS 8c pair. Anklets 12c pair. Socks 9c. Print 17c. Panties 12c. Dresses $1.95. Slips 47c. Undershirts 17c. Rugs 70c. Robes $1.65. Spreads $2.65. $70.00 Watches—$18.95. Jewelry Sets $1.25. Pens 8c. Combs 1c. Aspirin $1.00—1,000. Brushes 9c. Razor Blades 5—2c. Electric Razors $2.00. Complete Stock List. Picture Catalogue 25c if sent immediately. Sibert's, Chattanooga 4, Tenn.

GOOD Money In Weaving. Weave rugs at home for neighbors on $69.50 Union Loom. Thousands doing it. Booklet free. Union Looms, 154 Post St., Boonville, N.Y.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

AFRICAN Exports wholesale prices hand made leather goods, French perfume. Send $3 for sample and literature. Drown, B.P.O. Box 302, Tanger, Morocco.

LADIES, earn extra cash by addressing advertising postals at home. Write, Vali Co., Box 1042, Muncie 10, Indiana.

71 FOR SALE MISCELLANEOUS

PEARL shell two pounds $5.00. Sample $1.00. Terrell Nichols, Box 125, Bowie, Texas.

BUILDERS—Contractors—Home Owners—Buy That Safe Now. Wall and Floor safes. Write for information. Ernie Scott, 7905 Birchdale, Chicago 35, Illinois.

NEW! Retractable Pen & Refill 75c postpaid. Lehman, 1125 Evergreen, New York 72, New York.

BIG discounts on branded quality merchandise—order now for Xmas. Free catalogue. Ascot Sales, 45-34B 218 Street, Bayside, New York.

BAROMETER—German 85mm. Forecast weather accurately. Guaranteed. $5.95. Taylor, 600 Nimitz, Desplaines, Illinois.

DU-AL Hone. Entirely new product, extremely fine hard and sharp, for double-edged razor blades, pocket knives, surgical instruments, tools, etc. Eliminates stropping. Will give many more smooth shaves per blade than ever had before. Far out performs all blade sharpeners tested. Will last years. Price $1.00 postage paid. De Nayson Corporation, Box 931, Philadelphia 5, Pa.

72 WANTED MISCELLANEOUS

SCRAP Mercury (Quicksilver) containers supplied. Tantalum—Bismuth—Tungsten. Metallurgical Products Co.—Established 1908, 38th & Moore Streets, Philadelphia 45, Pa.

SAW Filer and Grinder. Box 574, Pearl River, New York.

QUICKSILVER, Platinum, Silver, Diamonds. Prompt Payment. Mercury Terminal, Norwood, Massachusetts.

74 RAZOR BLADES, SHAVERS

100 HIGHEST Quality Blades $1.00. Sample 10c. $20 Electric Shavers $4.95. Paul Hollman, 7004 Merrill, Chicago 49, Ill.

75 TATTOOING SUPPLIES

TATTOOING Course and Supply Brochures. 25c. Zeis School, 728 Lesley, Rockford, Illinois.

76 DRAWING SUPPLIES & EQUIPMENT

IMPORTED West German Precision Lotter "Geared Head" Drawing Instrument Sets. $7.50 up. Send for free brochure. Empire Engineering Supply Company, Box 114, Canal Street Station, New York City 13, N. Y.

77 TREASURE FINDERS

GOLD, Silver, Metal Detectors, Geiger Counters for Uranium, Mineralights. Sensational new fully guaranteed models. None Finer. Information Free. Detectron Co., 5420 Vineland Ave., North Hollywood, California.

TREASURE—M-Scope Geiger Counters—Mineral Locators. Why buy something inferior when you can buy the best at a lower price? Backed by years of experience. Fully guaranteed by factory. Detects minerals, metals, gold, silver, coins. Payment plan available. Proven superior performance. Free 16 page illustrated booklet. Fisher Research Lab., Inc., Palo Alto, Calif.

TREASURE Hunters! New 11-pound featherweight Model 101 locator for gold, silver and minerals. Money-back guarantee best available. Also Geiger Counters for uranium prospectors. Complete information free. The Goldak Company, 1540 W. Glenoaks Blvd., Glendale 1, Calif.

SELECTIVE metal and mineral detector. Revolutionary design. Distinguishes metals from black magnetic sands. Readily detects metals under salt water. Also Geiger Counters. Free literature. Gardiner Electronics Company, 2018 N. Dayton, Phoenix, Arizona.

LOCATE Hidden treasure, distinguish minerals from metals with Model 100 Detector. Weighs 5 pounds, extremely sensitive. Factory assembled ($79.90) or kit form ($39.90). Free Literature. Dept. G, Electronic Applications, Box 4975, Washington 8, D.C.

"SNOOPER" Geiger counter. Only $29.95 complete. Super-sensitive. Pocket size. Find a fortune in uranium. Order now. Send $5.00, balance c.o.d. Money back guarantee. Free catalog-Scintillator and larger uranium and metal detectors. Precision Radiation Instruments, 2235CPS So. LaBrea, Los Angeles 16, California.

78 WATCH REPAIRING

WATCH and clock repairing books for hobbyists. Free information. North American, Dept. 23-M, 2330 N. Milwaukee, Chicago 47, Illinois.

WATCHMAKERS' — Jewelers' complete informative catalogue 20c. Bengal Company, Culver City, California.

WATCHMAKERS' Tools, Materials, Supplies, Watches. Catalog. Gales, Box 1000, Chicago 90, Illinois.

5 ELGIN, Waltham, Illinois, Hampden Gents' wristwatches needing minor repairs, $18.00. Write for prices. H. Lowe, Holland Bldg., St. Louis 1, Mo.

WATCHMAKERS! Beginners! Watches, Movements. Descriptive list. Box 150, Chicago 90, Illinois.

79 MISCELLANEOUS

"SANTA Claus" Personal letter will delight your children. Information free. Santa's Letter, 501-P Elgin, Houston, Texas.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

WOW!! this French-type perfume really sells. 60% off! Free sample. Elliot-Stuart, Ltd., 4616B Hollywood Blvd., Hollywood 27, Calif.

BUY vitamins direct. Amazing savings. Catalog free. Matoska, White Bear Lake, Minn.

BUY Wholesale thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, 631-E Linden, Buffalo, New York.

PLASTIC Tea Aprons $1.00 (Refundable). Harrison, 14913 So. Wanette, Bellflower, California.

COPPERWARE cleaner guaranteed simple old-fashioned formula 25c. Opsahl, 1720½ Carmona, Los Angeles, Calif.

25 TO 50% discount: Appliances Giftware Cameras: Catalogue 50c refundable. Dart, 3812 Atlantic Ave., Brooklyn 24, N.Y.

MAGNETS—Permanent Alnico. Never loses magnetism. Excellent for map and bulletin board work. Many uses. 12 for $1.00. Pritt Co., Dept. MS-12, 12 West 27th, N.Y.C.

EASILY home made windmill gives plenty power. Guaranteed instructions $1. Ziemban, 6123 Orchard, Dearborn, Mich.

ASTOUNDING! Secret of Persuasion! Free! Amaze everybody! Dubois, 880 Churchill, Montreal 16, Canada.

POPULAR SCIENCE OPPORTUNITIES

BIG interesting mails three months 25c, year $1.00. Harvey Teeple Decatur, Ind.

SENSATIONAL new "Send Ease" sanding blocks for removing old finishes and preparing new wood, smooths plaster. Faster and more economical than sandpaper. Five large 2"x3"x5½" blocks Postpaid $1.00. J. C. Ivey Company, Dept. S, 414 Main Street, Cincinnati 2, Ohio.

FREE Catalog Organic Dates, Figs, Nuts, Honey. Tontz, Elsinore, Calif.

WORK Clothes below wholesale cost. Quality cotton pants 89c, shirts 79c, coveralls $1.69 and shop coats $1.59. All clothes reconditioned, sterilized. We will ship anywhere C.O.D. Write Eastern Processing Co., Box C, Franklin Station, Baltimore 23, Maryland.

RECEIVE magazines, samples, catalogues, Mails from everywhere. Offers hundreds. Larger listing 35c. Rorick, Box 86M, Cincinnati 26, Ohio.

HEARING Aid Batteries. Lowest Prices. Ellis, Box 51, York, Pa.

300 BIG Mails guaranteed, samples, offers, plans, propositions, 12 months listing $1.00 (refundable). Wright Publications, 2276 Hubbard, Memphis 8, Tenn.

FREE! Gold plated cameo ring. Send 6c in stamps. Doc Box 12, Phillipsburg, N. J.

YOUR Leather Jacket renovated expertly. Free circular. Berlew Mfg. Co., Dept. 7, Freeport, N. Y.

80 PERSONAL

DETECTIVE'S Opportunities. Detective particulars free. Write Wagoner, P-125 West 86th, New York 24.

"HOW Can I Find Out?" You Can! Information confidentially developed. Any matter, person, problem. World-wide. Officially licensed. Established 1922. William Herman, 170 Broadway, New York.

INCREDIBLE! Become Mental Superman Overnight! Free Booklet! Bijou, Box 1727-VC, Hollywood 28, California.

LETTERS Remailed promptly. 25c. Dietz, 158 East 102nd Street, New York City 29.

LETTERS remailed from Colombia $1.00. Kent, Apartado Aereo 1700, Medellin, Colombia.

ADDRESS advertising postcards. Must have good handwriting. Lindo, Watertown, Mass.

MIAMI remails. 25c each. Melody Mailers, 8031 Biscayne, Miami, Florida.

"X-RAY Mind." Dangerous power over others. Inquire. Send dime. Krishnar Institute, 1912 Lincoln-Park-West, 222-SZ, Chicago 14.

DRUG Sundries Wholesale. Men, Women. Illustrated list 25c coin. Ally, 1123 Ellicott, Buffalo 9, N. Y.

LETTERS remailed 25c, private receiving, forwarding address available. Lenza, 3122-B Arizona, Santa Monica 2, Calif.

MAIL from The Sunshine City! Letters and cards remailed 25c. The Florida Shopper, Box 428, St. Petersburg, Florida.

LETTERS remailed from Panama. $1.00. United Services, Box 530, Colon, Panama.

POWERFUL mental telepathy practical. Joe Johnson, Globe Rd., Lewisburg, Tenn.

HAND Guide. Corrects your Penmanship in 10 hours. Write Perfect Penmanship, Box 665-35P, St. Louis, Missouri.

MIAMI, Miami Beach complete Sunday classified. Jobs, Rentals, etc. Airmailed $1.00. New Year's "Orange Bowl" Edition $1.00. Letters remailed 25c, six $1.00. Six postcards $1.00. Page, Box 1097, Coral Gables, Florida.

LETTERS remailed from Los Angeles or Long Beach 25c. R. Harrison, 14913 So. Wanette, Bellflower, Calif.

BIBLE reveals Time Of End. Free. Write: Harvest, Jefferson City, Missouri.

PROSPERITY through atomic mind power. 9c brings formula. Gosomar, 6th Floor, 90 West Broadway, New York City 7.

KING of Siam Palace postcard enclosed free! Siam—letter realrmail $1.00, 3 for $2.00, 5-$3.00. Surianont, Box 696, Bangkok, Siam.

KANSAS City remails. 25c, registered $1.00. Kithcart, 2630 Charlotte, Kansas City, Mo.

MIAMI, Miami Beach. Remails 25c. Arthur Warner, 901 NW 50th St., Miami, Fla.

PARIS—Letters realrmailed $1.00. Lucas, 50 Rue du Four, Paris 6, France.

"INTERESTING Mails"—25c keeps your mail box full three months. Bentz, Desk-J/2, Chatawa, Mississippi.

REMAIL Xmas Cards 25c fool your friends, fake Texas Xmas vacation. Jackson, P.O. Box 7223, Hackberry Sta., San Antonio, Texas.

FRENCH Canada remails—Montreal postmark 50c each—Conrad Legault, 12272 Desenclaves, Montreal, Quebec, Canada.

LETTERS, post cards remailed from nation's capital. Fast, dependable 25c. Ken-Mac, P.O.B. 6713, Washington 20, D.C.

APTITUDE, Personality Test. Positive inspirational with detailed personalgraph $2.00. Free particulars. A. Willis, Director, Burlington, Wisconsin.

MEXICAN Law, General Practice Attorney, 1203 Arizona Street, El Paso, Texas.

AT Last! A budget that really works! Make your dollars go farther. Send today for printed expense control budget with complete instructions. Only $1 postpaid. Ludecke, Box 85, South Gate, California.

LETTERS remailed San Francisco Postmark 25c. Private receiving-forwarding address available. Shanks, Box 3110, San Francisco 19, California.

GOD—Universe—Mind. How can their unlimited power bring wealth, success, happiness into personal affairs, job, business and profession? What is the secret? Write for Free literature—it could change your life! Cosmo-Psycha, Dwr. 3246, Olympic Station 7, Beverly Hills, California.

HOW TO SAVE MONEY ON *Home Repairs!*

NEW BOOK MAKES IT EASY!

Only $1.49

NOW you can save up to 50% on household repairs if you follow simple instructions in the big new illustrated book, *Tinkering With Tools!* Here you'll find everything you need to know about woodworking, shingling, plastering, interior and exterior painting, plumbing, wiring and masonry! In a jiffy you can learn how to repair faucets, valves and traps, electrical appliances, how to refinish floors and furniture, lay sidewalks, panel walls, renew sash cords, stipple walls—hundreds of home repairs so easy to make!

Never before have so many money-saving helps—plus hundreds of pictures—been packed into one big 260-page cloth-bound DeLuxe volume to sell for ONLY $1.49! A book this big should cost $3.50 or more!

SEND NO MONEY—ORDER TODAY

Mail your order now, and pay postman on delivery ONLY $1.49 plus shipping cost. If after 7 days' FREE TRIAL you aren't completely satisfied, return book and we'll gladly refund every cent. Write to:

POPULAR SCIENCE, Dept. 1253
353 Fourth Avenue, New York 10, N. Y.

New Thrills for Model Railroaders!

Hundreds of new ideas that will save you money and make model railroading more fun than ever! Shows how to lay your own track, how to make automatic signal systems, culverts, roundhouses, tunnels, switches and other modern railroad equipment.

It's easy to follow the clear, simple instructions and diagrams in this new book. Shows how to make freight cars, baggage cars, pullmans and day coaches. In addition, there are complete instructions and blueprints for building a Pennsylvania R. R. type locomotive.

SEND NO MONEY

Just write for your copy of MODEL RAILWAYS today, and pay the postman only $2.49 plus a few cents postage on delivery. If you prefer to remit now we pay postage. Money back if not satisfied. Address

POPULAR SCIENCE MONTHLY—Dept. 1253
353 Fourth Avenue • New York 10, N. Y.

GUNS

12 MODELS "AUTHENTIC REPLICAS"

START YOUR COLLECTION TODAY!

Colt Cobra .38

Collection includes:
Russian Tokarev
German Luger
Czechoslovakian Pistol
Italian Brevettata
German Mauser
Japanese Nambu
Spanish Moxley
Belgium Automatic
German P-38
Frontier .44 Colt
Colt .45 Automatic

- **Reproduced in Actual Size, Design and Balance.**
- **Made of Solid Cast Aluminum**
- **Finished in Gun Metal Black**
- **"He-Man" Trophies for Den, Rumpus Room, Cabin, Etc.**

Send Cash, Check or Money Order.
(In Calif. add 3% Sales Tax)
Sorry, No Canada Orders or C.O.D.'s

ONLY **$2.00** each postpaid

LYTLE NOVELTY CO.
2656 Fashion Ave. Long Beach 10, Calif.

PLYWOOD BOAT KITS

(Freight Included) 12 FT $97.00
14 FT $129.00

Build this 12 or 14-ft. sport runabout from ready-cut parts. Kits include all hardware, etc., to complete the boat shown. Send for free folders of all models as low as $32.00 freight included.

TAFT MARINE WOODCRAFT
Dept. W, 636 39th Ave., N. E., Minneapolis 21, Minn.

Want a HOME?

Before you choose, be sure to GET THE FACTS about Schult mobile homes. Write or wire Dept. 3112
SCHULT CORP., ELKHART, IND.

SCHULT TRAILERS

NEW SWEDISH COMPASS KNIFE
EVERY SPORTSMAN NEEDS ONE!

Reliable, built-in compass. Superbly tempered 4" steel blade. Beautifully grained Mazur wood handle. With gen. leather sheath.

$2.95

See your dealer

WESTERN ARMS CORP.
411 East Pico Blvd., Los Angeles 15, California

CASH EVERY DAY

taking orders for sensational plastic

Auto Seat Covers

Every car owner your prospect ... your own seat covers as bonus

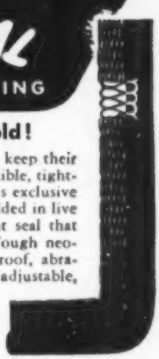
Here's the BIG MONEY business . . . taking orders from car owners with prospects unlimited! Just show America's most exciting Auto Seat Cover values. Newest materials, fine quality, superb tailoring, perfect fit . . . PLUS LOW PRICES . . . all help you get orders for the asking. No experience needed. Earn spare hours or full time. Start now . . . SEND NO MONEY . . . we supply everything needed. Rush name and address for big sales outfit, FREE. Write today.
Includes many actual fabric and material samples.

BIG OUTFIT FREE Write Today!

KEY PRODUCTS, Dept. 6312, 800 N. Clark St., Chicago 10, Ill.

Make Your Home Draft-Proof

WITH *Bridgeport* **INNER-SEAL** WEATHER STRIPPING



over 600 million feet sold!

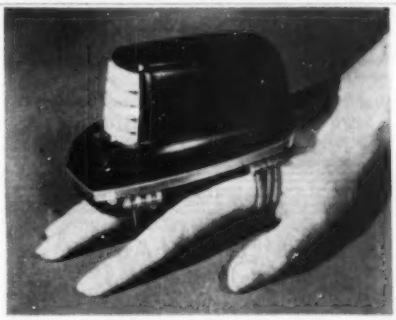
Home owners from coast to coast keep their fuel bills low with INNER-SEAL, the flexible, tight-sealing weather stripping! INNER-SEAL's exclusive patented construction — spring steel molded in live sponge rubber — makes a pressure-tight seal that keeps heat IN . . . keeps cold OUT! Tough neoprene coat makes INNER-SEAL waterproof, abrasive-resistant, durable. INNER-SEAL is adjustable, fits perfectly even on warped frames. Easy to install, lasts for years . . . has dozens of handyman uses.

For your overhead garage doors — heavy-duty INNER-SEAL Weather Strip Cushion . . . seals out moisture, cold, dirt . . . prevents doors from splintering or freezing.

Get your FREE copy of the new 24-page booklet "Why & How To Weather-Strip". Available where you buy your hardware or building supplies.

OR, WRITE DIRECT TO DEPT. PS-12

BRIDGEPORT FABRICS, INC., BRIDGEPORT 1, CONN.



New VITALATOR With

Real "Swedish Massage" Action!

Enjoy this new, pleasant way to massage away fatigue, soothe jumpy nerves, ease tension! Excellent for facials, after-exercise massage, aching muscles, headaches, "waistline control," hair and scalp health. Preferred by thousands for its wonderful **Swedish Massage** action . . . the rotary massage method which feels so good and is so good for you! VITALATOR operates on AC or DC. Just slip it over your fingers; turn it on, and thousands of gentle massage pulsations travel through your finger tips to ease body aches and pains, relax tense muscles.

VITALATOR is compact, lightweight, easy to use. And so enjoyable—melts away tiredness and fatigue, leaves you feeling refreshed, relaxed. Anyone can use it, and everyone will enjoy it. Order by mail today—only $15.50 postpaid. Check, money order or C.O.D. Immediate delivery. Try VITALATOR for 10 days at our risk—if not delighted, return for immediate refund, including postage.

HUGH CLAY PAULK
304 Kansas Ave., Dept. V-29, Topeka, Kansas

A Christmas Favorite for 42 years

Northland SKIS

Beautifully hand crafted . . . a model for every skier. Giving or receiving, every winter sports enthusiast prefers to see internationally famous Northland skis under the Christmas tree.

Look for the Deer Head Trademark
Write for FREE booklet on how to ski

NORTHLAND SKI MANUFACTURING CO.
94 Northland Park · North St. Paul 9, Minn.
WORLD'S LARGEST SKI MANUFACTURERS

SEA SHELL KIT BOAT

More than 32,000 in use. Kit includes pre-cut marine plywood and wood parts, brass screws, seam compound, full instructions. A rugged boat, easy to assemble. Free booklet.

Sea Shells of Branford
8270 N. Main Street
Branford, Conn.

In Canada
Roberts-Ross, Ltd.
Orillia, Ontario

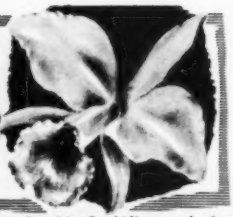
FRAMED IN FAME—
Safety-Engineered
UTILITY AXLES

MODEL 1-UCO, shown, features 1½" square axle of solid steel; 2500 lb. capacity. Comes completely equipped, except for tires. List price $68.29 postpaid (when paid in advance). Other models to 5000 lb. capacity. We manufacture a complete line of trailer parts; write for Brochure 14-L.

HAMMER BLOW TOOL CO.
"As old as the Industry!"
WAUSAU, WISCONSIN

A Fascinating Hobby!
A Fabulous Profit!

GROW ORCHIDS at HOME



Imagine, beautiful Cattleyas, Exquisite Cymbidiums, and other colorful varieties...growing, blooming, right in your own living room! A single Orchid plant on a card table or window sill, can multiply into a fortune! **NO EXPENSIVE EQUIPMENT NEEDED! GROWS IN ANY CLIMATE!** Learn the amazing secrets, with easy-to-follow instructions. **WRITE TODAY FOR FREE ILLUSTRATIONS** and details on obtaining already potted **ORCHID PLANTS FREE!**

ORCHID-LAND
DEPT. 4B, BOX 27801, LOS ANGELES 27, CALIFORNIA

YOU KNOW YOU CAN TRUST A HULL AUTO COMPASS

● It's great to be completely confident of directions wherever, whenever you drive. Enjoy this absolute assurance with a HULL AUTO COMPASS . . . guaranteed more accurate because of special, patented features.

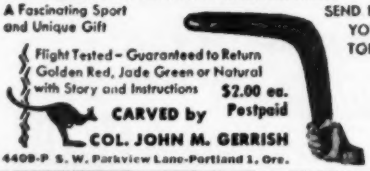
WRITE FOR LOCAL DEALER'S NAME, FREE LITERATURE

Beaconlite '6' Streamline '4'

HULL MFG. CO. P.O. Box 246 E-12 WARREN OHIO

LEARN TO THROW THE BOOMERANG

A Fascinating Sport and Unique Gift



SEND FOR YOURS TODAY

Flight Tested – Guaranteed to Return
Golden Red, Jade Green or Natural
with Story and Instructions

$2.00 ea. Postpaid

CARVED by COL. JOHN M. GERRISH

4409-P S. W. Parkview Lane-Portland 1, Ore.

Party Records
FOR ADULTS ONLY

THEY'RE TERRIFIC! Brand new series of exclusive records. Spicy songs packed with teasing wit and lusty humor. The kind you will like. Complete set of **SIX DIFFERENT SONGS** on finest quality 78 or 45 R.P.M. records (state choice), sent prepaid for $4.95 in sealed package. No C.O.D.'s.

NATIONAL, Dept. 478, Box 5, Sta. E, TOLEDO 9, OHIO

3-WAY ENGLISH AIR PISTOL

Uses Corks · Darts · .177 Cal. Pellets!
Air Pistol, made in England—outstanding in action, outstanding in value! This real, hard-hitting pistol has a handsome jewel-like chrome finish—looks and shoots like a much more costly pistol. Here's a lot of fun and sport at amazingly small price! **FREE!** 500 pellets (Retail value-$1.75) 1 Dozen Darts, 75c. **Order by Mail!**

Only **$5.95** FOB, N.Y.

Send Check or Money Order
Godfrey Import Corp., Dept. P-12, 277 Broadway, N.Y.C.

CHROME "PERFECTA" BLANK PISTOL AUTOMATIC

REALLY automatic! Keeps shooting — no delay! Ejects empties automatically! Exclusive feathertouch trigger pull for youths or women. 8 shots. For Sports, Radio, TV Shows! Scares intruders. Chrome Finish. Special at **12.50**

REG. MODEL BLANK PISTOL, BLUE FINISH 9.95
BLANK CARTRIDGES • 100 for 1.50

BY MAIL FOR MALES

ORDER BY MAIL • No Police Permit Req.
SEND CHECK OR M.O.
GODFREY IMPORT CORP., DEPT. P-12 277 B'WAY, N.Y. C. 7

GIANT BALLOONS

Surplus U.S. Gov't. (new—overage) Neoprene weather, target balloons. For **FUN** or **PROFIT.** Great sport in the backyard; or for parties, picnics, dances, fairs. **MONEY-MAKERS.** Use these balloons to attract crowds to civic events, conventions, exhibitions, trade shows. **TERRIFIC** for high school and college **PROMS.** All sizes are approx. inflated sizes. Postage prepaid on prepaid orders.

3 ft. dia. 49c—6 ft. dia. 99c
13 ft. dia. $1.59—20 ft. dia. $1.95

"Marksman" AIR PISTOL

It's a target pistol but it looks, feels, muzzle loads and cocks like an army .45. You can have fun indoors in rumpus room or basement; or out in the back yard or woods. Make it a test of skill and "outmarksman" your friends. Caliber .177, accurate, high-powered, guaranteed. Complete with free supply of BB's, darts & pellets. Full payment must accompany order. **$5.95**

EXTRA AMMUNITION AVAILABLE

Darts, **50¢** doz.—BB's, **15¢** for 150—Pellets, **$1.50** for 500

Add 10% for handling & delivery of air pistol and ammunition
Calif. residents please add sales tax on all items

WAR ASSETS DIV. VOLUME SALES CO.
Dept. S-12-53 3930 Sunset Blvd. Los Angeles 29, Calif.

BOWS·ARROWS·MATERIALS

FINE BOWS and ARROWS
SELECTED RAW MATERIALS

Catalog 5c *Send for it*

HAND BOOK—Illustrated Instructions on Making and Shooting Archery Tackle—75c

L. E. STEMMLER CO.
Manorville (Box 11 L. I. N. Y.

BUMPER STRIPS THAT GLOW RED
PROTECT YOUR CAR FROM NITE ACCIDENTS

Reduce dangerous nite accidents, trim bumpers with these 1" reflective strips. Easily applied in 3 minutes. Glow fiery red when car lights touch them. Visible even in fog. 1 foot strip for one bumper, only $1. Order now! **$1**

KENT ORIGINALS Dept. 17
260 SolAir Dr., N. E. Grand Rapids, Mich.

250 POWER .....

Complete Telescope Lens Kit only **$3.49** postpaid

Conquer Space, Explore the Universe, Planets, Moon Craters, New Stars, etc. Complete Lens Kit consists of 50 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PS-17

COLOR PRINTS
From Your Transparencies

Electronically controlled for superb results. Rapid service and satisfaction guaranteed.

Prints from any size transparency | ANSCO COLOR · KODACHROME · EKTACHROME

4 x 5	5 x 7	8 x 10
50¢	$1	$2

25c 2¼x3¼

Min. order $1. No C.O.D.'s

PROCESSING: ANSCO & EKTACHROME
24 hours—Roll Film 120-620, 35 mm, 20 ex mtd. . . . Only $1.00 roll

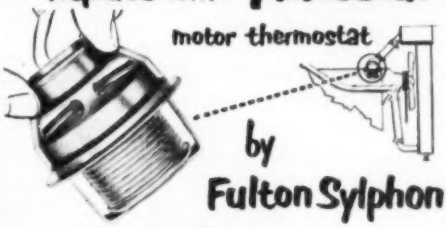
COLORFAX LABORATORIES DEPT. S-123 BOX 3521 Georgetown Sta., Wash. 7, D.C.

This WINTER
CHECK YOUR MOTOR THERMOSTAT

A dirty, damaged or over-age motor thermostat impairs your car's cooling system. This often results in engine "boil-overs" and loss of anti-freeze. Also, an over-heated engine wastes gas and oil . . . while one that runs too cold results in failure to warm your car heater.

So protect both your comfort and your pocketbook. Get your Service Man to check your car thermostat. And if a new one is needed—

Replace with Autostat® motor thermostat



by Fulton Sylphon

Get faster starts and faster warm-ups with Autostat. Get more miles per gallon, more comfort per mile. Save oil and reduce car maintenance. Types for every make and model; quality-made by the pioneer builder of car thermostats.

Robertshaw-Fulton
CONTROLS COMPANY
FULTON SYLPHON DIVISION, KNOXVILLE, TENN.
BRIDGEPORT THERMOSTAT DIVISION, BRIDGEPORT, CONN.

SPEEDS

- automotive bench and body jobs
- metal fabrication jobs
- machine assembly and repair
- appliance assembly and repair
- electrical installation and maintenance

The new 2U Impactool will do all these jobs—and do them fast—

- run and remove nuts
- tap
- saw holes
- drill
- drive and remove screws
- drill masonry
- ream
- drive and remove studs
- bore wood
- extract broken studs
- run wire brushes

This newest and lightest Impactool has the time-proved Ingersoll-Rand impact mechanism that has an unmatched reputation for power and dependability in both air and electric Impactools. The "rotary" impacts do all the work. There's no kick or twist to the operator and the motor can't stall or burn out.

Ask for a demonstration of this new powerful little Impactool. Size 2U Impactool only $97.50, also available in metal kit with multi-purpose attachments. You'll find it featured by leading automotive jobbers and industrial distributors from coast to coast. Ask for a demonstration or write for catalog.

SPECIFICATIONS OF NEW 2U IMPACTOOL

Capacity, bolt size	1/4"	Impacts per minute	2100
Weight, hose cable	5 lbs.	Square socket driver	3/8"
Free speed	1750 rpm	Standard voltage	110 volts AC-DC

Ingersoll-Rand

11 Broadway, New York 4, N. Y. • Dept. S-12

Originators of Impactools—Air and Electric

4 SIZES OF I-R ELECTRIC IMPACTOOLS TO MEET YOUR NEEDS

POPULAR SCIENCE
REG. U. S. PAT. OFF. Monthly

Diesels Even Run Bikes Now

This 11-pound kerosene engine makes riding cheaper than walking.

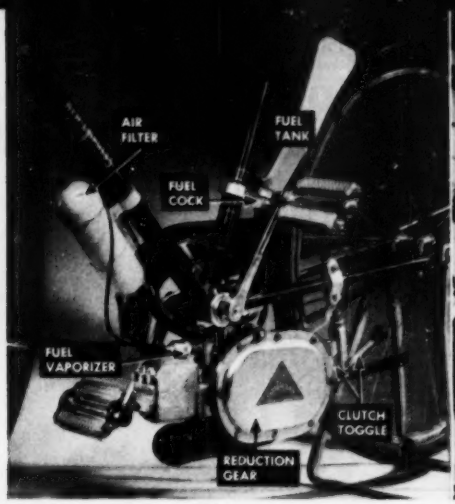
By Harry Walton

NOT content with shoving steam off the rails and nudging the gas engine aside on our highways, the diesel is now barking at the heels of bike riders.

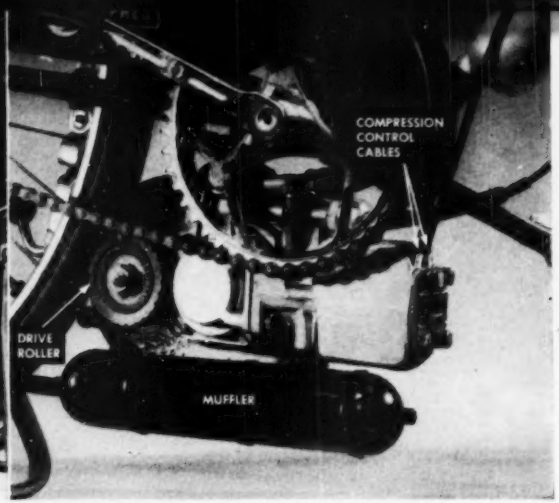
You have to look twice to find this ¾-hp. job on the bicycle. Measuring only three by six by 13 inches, it nestles close under the pedals, keeping its 11 pounds as close to the ground as a politician's ear.

Nor will you find any complication of sprockets, chains, pulleys or V belts. The drive to the rear wheel is by a rubber friction roller in direct contact with the tire. If you should run out of fuel (which scarcely seems possible) you can push a lever to free the roller, and pedal on.

Pedal to start it. Invited to ride, you give the midget another dubious look and hoist your poundage onto the bike. At once engine drag makes itself felt. You have to lean hard on the pedals to get moving, for you're spinning the crankshaft too. Then you remember to

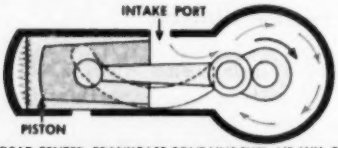


ENGINE IS HUNG just below crank bearing on a single bolt. Drive roller can be disengaged from rear wheel for ordinary pedaling by lifting ball-tipped lever. Control cables, already connected, are simply tightened on handle bars. Installation takes 12 minutes.

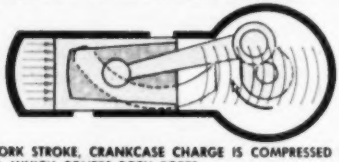


WHEEL IS DRIVEN by a 2½-inch roller in contact with tire. With 1:3 reduction gear built into motor, this provides an over-all reduction of more than 30 to one. Tire diameter has no effect on top speed: engine will drive a 24-inch bike at same rate as a 28-incher.

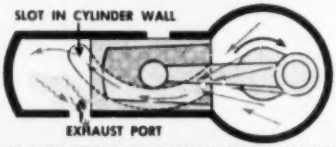
HOW TWO-CYCLE ENGINE WORKS is shown in four steps. Precise instant of firing is controlled by degree of compression. Transfer slots in cylinder provide path for crankcase charge to get above piston. Slots are curved to give incoming charge a path that directs it away from exhaust port and helps scavenge exhaust gases with minimum loss of fuel.



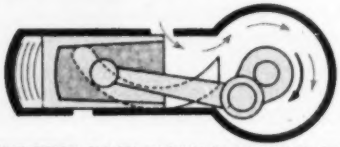
AT TOP DEAD CENTER, CRANKCASE CONTAINS FUEL-AIR MIX. CHARGE ABOVE PISTON IS COMPRESSED TO FIRING TEMPERATURE.



ON WORK STROKE, CRANKCASE CHARGE IS COMPRESSED BELOW PISTON, WHICH COVERS BOTH PORTS.



AT END OF WORK STROKE, PISTON UNCOVERS EXHAUST PORT AND TRANSFER SLOTS. PARTIALLY COMPRESSED CRANKCASE CHARGE ENTERS CYLINDER AS EXHAUST OCCURS.



RETURNING PISTON CREATES VACUUM IN CRANKCASE, DRAWING IN FRESH AIR-FUEL MIX AS INTAKE PORT IS UNCOVERED. MEANWHILE NEW FIRING CHARGE IS COMPRESSED ABOVE PISTON.

cut in compression, and the pedals get even harder.

But suddenly the engine catches, takes off with a soprano bark. You're power-borne, and feel a bit foolish as the pedals go slack. As you hastily retard the compression control, the engine dies.

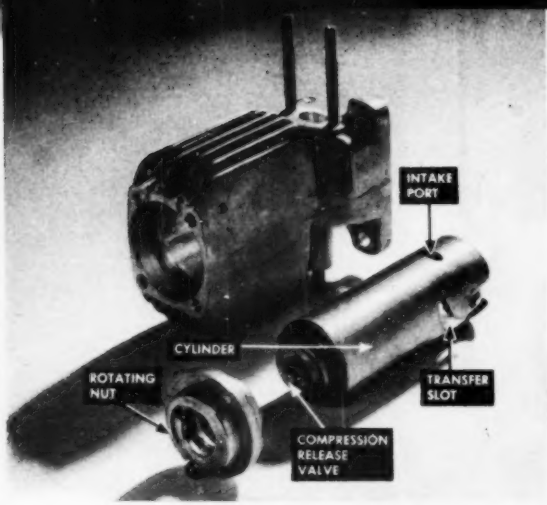
You turn the compression control fully back and start again. This time, when the engine catches, you adjust fuel and compression warily. Finding the strategic point where the engine runs smoothly, you relax to enjoy power biking.

Throttling down, you can roll along at little more than a walk. Open up the fuel, adjust compression to match the load, and you're rolling at a brisk 22 m.p.h., a good pedaling clip.

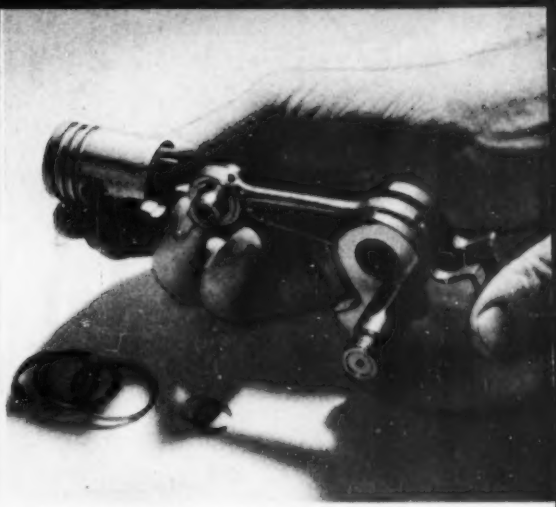
At this rate, the engine is revving up to about 6,000 r.p.m., not an excessive speed in view of its alloy piston, roller-bearing big end, and ball-bearing shaft.

Hitting a hill, the engine buckles right down and pulls. Back off the compression a bit—it acts something like the spark advance on yesterday's cars. You slow down, but you'll keep rolling up any grade the average car can pull in high gear. On tougher ones, you help the engine by pumping.

Twentieth of a cent a mile. Importers of the German-built engine claim it will



STEEL CYLINDER, closed at head end, slides short way in finned housing to alter compression ratio. Nut turned by control cables works on threaded part of cylinder to govern its position. Transfer slots are closed by housing wall, forming channels for fuel charge.



MIDGET PISTON is 1 3/32 inches in diameter (cylinder bore is 28 mm.). Piston has three rings, pinned to prevent rotation. Big end of con rod, pressed between crank webs, is fitted with roller bearings. Shaft runs on ball bearings. Stroke is 30 mm. (1 3/16 inches).

run a bike about 150 miles on a tankful of juice—less than half a gallon.

With kerosene at 15 cents a gallon, this would work out to 1/20 of a cent per mile. At today's price for half-soling, this makes riding cheaper than walking.

Of course the drive roller puts an extra friction load on the rear tire, which will therefore wear somewhat faster. The roller itself will require occasional replacement. And in addition to fuel, you have to buy motor oil, which is added to the tank. A jigger in the cap measures out correct proportions.

Compression ignites fuel. Strictly speaking, the engine is a two-cycle, compression-ignition job rather than a full diesel, since the fuel is atomized and drawn in with the air instead of being injected. But it works like a diesel in that there is no magneto, battery, spark or glow plug. Only compression heats the charge to the firing point.

You can buy the engine for either gasoline or kerosene operation. The only difference is maximum compression ratio —30 to one for gas, 33 to one for kerosene.

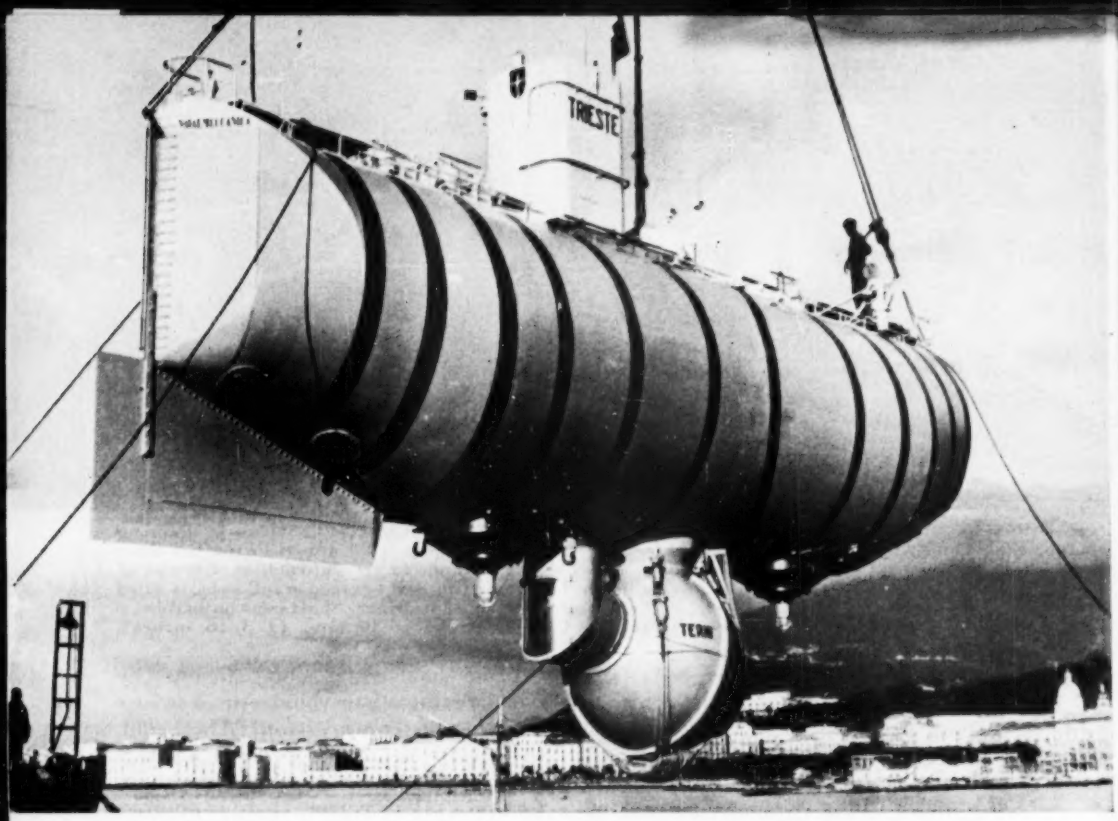
These compression ratios are for a cold engine. Once it's hot, they drop to less than half. The reason: the charge, as it enters the cylinder, is heated and expands so that the actual amount (by weight rather than volume) is less.

You vary compression. When cold, the engine has to be pedaled about a block to start it. Once hot, it roars at the first turn of the wheel. There is no driving clutch—you let the engine die at stops, and pedal it to a start when you go off again.

Hard starting, always a problem with diesels and small ones especially, is largely overcome by controlling compression ratio. The cylinder and head are virtually one piece, made to slide a short way inside the finned, die-cast housing. A round nut working on a thread on the cylinder can draw it back or forth, changing the distance between cylinder head and crankshaft, and therefore the compression space. The nut is connected to control cables.

Turned all the way out, the compression control slides the cylinder so far back that a protruding pin strikes the finned cover, opening a valve in the cylinder head. This releases compression to make it easier to start engine. A twist of the wrist restores compression.

Imported by Newage International, Inc. of New York City, the engine is sold by Gimbels and other retailers throughout the country. END



Gasoline-Filled "Balloon" Goes Down Two Miles into the Sea

THIS weird craft is a "bathyscaphe" in which Prof. Auguste Piccard recently descended to record 10,330-foot depth in the Mediterranean. Like an earlier design (PSM, Dec., '47, p. 82), it maneuvered as an upside-down "balloon," unattached to any cable. Gasoline in the hull-like structure was the buoyant medium, magnets held or dropped iron ballast, and the ball at bottom was the passenger gondola.

Jeep Attachment Munches Snow

DON'T throw a snowball at this jeep—it can throw back faster than you can. An extra engine out back powers the horizontal screws by an outsize flexible shaft, shown curling over the hood. A high-speed impeller throws the snow as far as 100 feet off the road. The attachment, made by Brede Products, Minneapolis, weighs 850 pounds.

Loggers Get Mechanical Loader

HERE'S a mechanical arm that has a 17-foot reach and enough muscle to lift 3,000 pounds of pulpwood at a clip. Jointed to bend like a human arm at wrist and elbow, it can pick up a quarter cord of eight-foot logs in its fist. The Badger Machine Co., Winona, Minn., makes it for mounting on any 1½-ton or larger truck.

New Styles in Helmets for Junior's Interplanetary Junkets

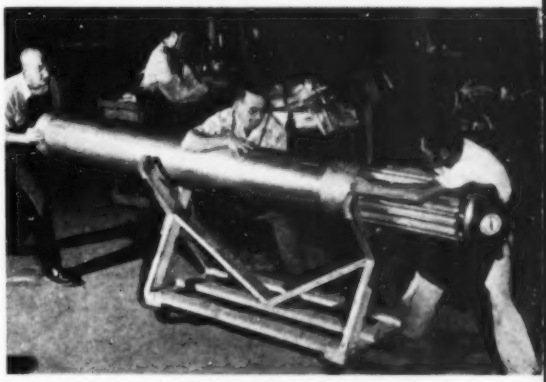
SNAP-ON helmet with domed top is official headgear on a popular TV show. It has simulated headphones and a hinged transparent facepiece that can be lifted while Junior downs his cereal before blast-off. This one is sold as a premium by General Mills.

BUBBLE job has shoulder plates and chest harness to keep it in place during intergalactic rough-housing. Flexible antenna on top is spring-mounted and plastic-capped for safety. Made by Arant Plastics, 1004 Folsom St., San Francisco.

SPACE cap has hinged goggles that flip up or down. Cone-shaped radar antennas around the lenses rotate to pick up blips from hostile raiders. A down-to-earth elastic chin strap holds it firm despite juvenile accelerations. Banner Plastics, Paterson, N.J.

Vacuum Helps Build a Plane

PROBLEM: how to fit a large corrugated metal tube inside a slightly smaller pipe? Solar Aircraft engineers solved it by applying vacuum to shrink the big pipe temporarily while the shroud is slid over it (right). The assembly is an augmenter tube for plane-engine exhaust gases that also gives warm air for cabin heating and anti-icing.



▶▶▶Chicken feathers may supply the bristles for paintbrushes, replacing Chinese hog bristles now blocked behind the Iron Curtain. A way has been found to convert feather protein into a synthetic bristle.

They Say Now .....

ALEXANDER W. STERN, PHYSICIST: *"Physics begins with the desire for knowledge and truth and ends in wonder—the wonder revealed by newly discovered truths of nature and in the miracle of existence."*

AN ANONYMOUS CHEMIST, IN "LETTERS TO THE EDITOR" PUBLISHED IN CHEMICAL AND ENGINEERING NEWS: *"Progress is usually made by questioning the unquestioned assumptions of 'the authorities.'"*

AUSTIN N. STANTON, PRESIDENT, VARO MFG. CO.: *"Many tests have been devised to predict the potentials of young people but I sincerely hope that none ever prove successful . . . No one uses more than a small fraction of his mental capacity. Why should it be assumed that this fraction should be the same for any two individuals? . . . The one whose total mental capacity is smaller than his neighbor's might easily use a slightly larger fraction and surpass him in creative thinking and work."*

"So Moses went down unto the people, and spake unto them."—Exodus 19:25.

THE STORY OF MOSES and the Ten Commandments, illustrated here by Gustave Doré, is in the Book of Exodus, the oldest known version of which was found recently in a cave.

READING THE BOOK OF ISAIAH in the world's oldest edition. Prof. John C. Trever (see chart on next page) discusses the Isaiah scroll with a Syrian Orthodox dignitary in Jerusalem shortly after the scroll was discovered.

Scholars say the discovery of more ancient manuscripts near the Dead Sea may be "the most sensational archeological event of our time."

Infrared Rays Clarify the Oldest Bible Texts

By Herbert Yahraes

OVER in Jerusalem this Christmas season, men are working hard and reverently, and with every chance of success, to throw new light on the Greatest Story and the Greatest Book.

They are bearded French Dominicans who are both scientists and priests. Members of the staff of the École Biblique et Archéologique Française—French Biblical and Archeological Institute—they have been entrusted with sorting out, preserving, and publishing a great new find of ancient manuscripts, the second in six years, from a cave above the Dead Sea. Scholars associated with the American School of Oriental Research are working with them.

The newly found manuscripts, originally written on sheets of parchment or leather, which were then sewn together to form scrolls, are now in fragments—bushels and bushels of them—the largest no more than half the size of this page. They are brittle, and some so darkened with age that it takes infrared photography to bring out the writing.

But this much is already clear:

The manuscripts date back to the earliest days of Christianity, and before. They include many copies of Old Testament books that may prove to be the most ancient Biblical texts in the original Biblical languages in existence. They also include books dealing with a little-known sect of Jews with whom John the Baptist may have lived.

Bedouins (Arabian nomads) discovered the manuscripts last year but news of the find was held up until after the Kingdom of Jordan, which feared that the documents might be smuggled out

MAP shows where the la:s. scrolls were found, in ancient Essenes' country.

TIGHTLY ROLLED SCROLL of Lamech, which probably contains the most ancient account of the life of Noah. It appears as it looked when found, except that one fragment has been removed. The manuscript is in Aramaic, the language of Jesus, and probably dates from early 1st century A.D. If so, it is the oldest Aramaic manuscript ever discovered.

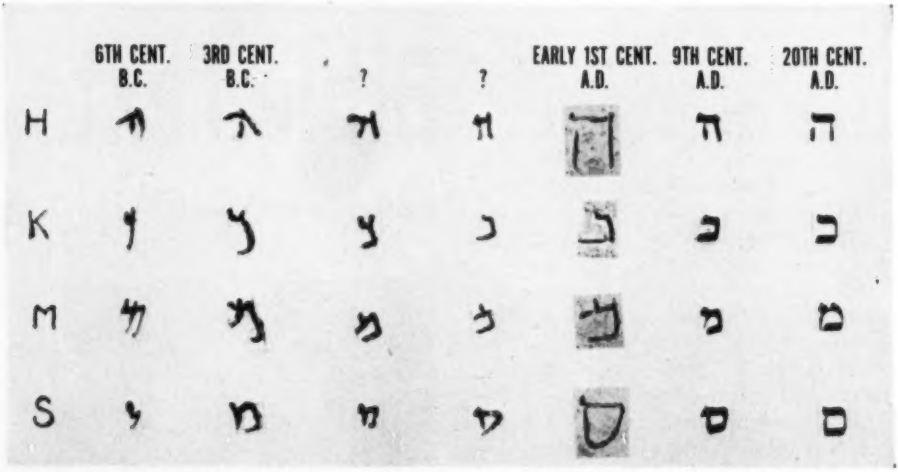
of the country and sold elsewhere, had paid the tribesmen $42,000 and given the treasures to Father Roland de Vaux at the École Biblique for preliminary study.

G. Lankester Harding, British-born archeologist who is Director of Antiquities for Jordan, calls the discovery "perhaps the most sensational and outstanding archeological event of our time."

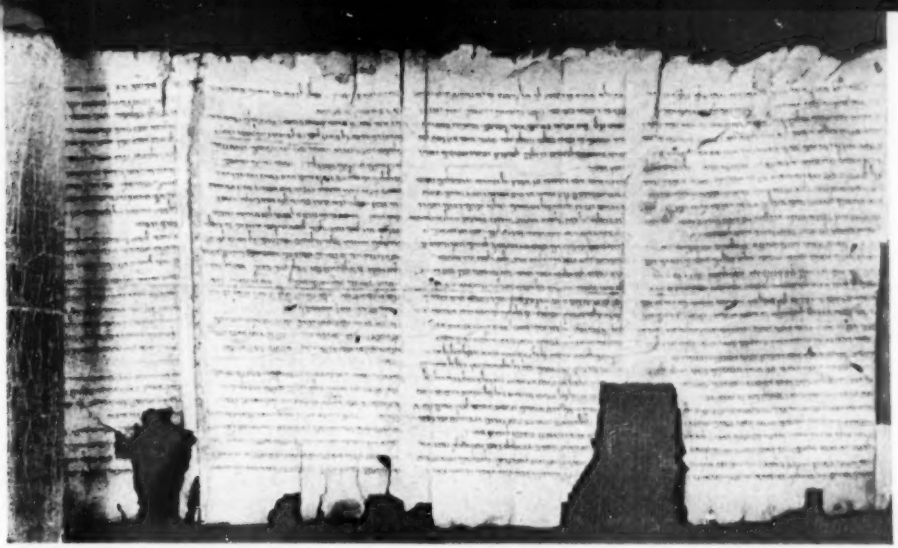
Harding ought to know. Since 1949 he has been racing the Bedouins to new discoveries, and this year he and other archeologists completed a second season of excavation at a small, ruined settlement now called Khirbet Qumran. This was built on a natural shelf several hundred feet above the northwest shore of the Dead Sea, in an area known in Biblical times as the wilderness of Judaea. The caves in which most of the manuscripts have been found are only short walks away.

Qumran turns out to have been the headquarters for the Essenes, or a related group of Jews—the sect that owned the scrolls and that hid them in the caves probably about 1,900 years ago.

The settlement consisted principally of a monastery-like building, which included a meeting hall for members of the order and a room fitted out with a



HOW DEAD SEA SCROLLS CAN BE DATED is demonstrated by a chart prepared by Prof. J. C. Trever, of Morris Harvey College, W. Va. It compares the forms of four letters from Hebrew-Aramaic manuscripts of known date with the forms of the same letters as they appear in the Dead Sea scrolls. You can easily see that letters in the left-hand center column (Isaiah) closely resemble but are more modern-looking (and therefore later) than those from the 3rd century B.C. Letters in the right-hand center column (Habakkuk), on the other hand, are still more refined but not quite so much so (and therefore earlier) as those from the 1st century A.D. Scholars figure that the Isaiah scroll dates from late 2nd or early 1st century B.C. and the Habakkuk Commentary from late 1st century B.C.



THE FIRST PAGE OF ISAIAH, in the Dead Sea scroll, looks like this. It is written on 17 sheets of sheepskin. The sheets are sewn together with linen thread, making up a manuscript 24 feet long. Since Hebrew reads from right to left, the first verse of Chapter I begins at the upper right. *(Photos courtesy of American Schools of Oriental Research.)*

table, bench, and inkpots for scribes working on the sacred scrolls.

Coins found in the ruins indicate that the Essenes lived there from some time in the second century B.C. until the time of the first Jewish revolt against Rome, in 70 A.D. Some scholars suspect that it was from there that John went forth to baptize in the Jordan River, just a few miles away, and to tell his questioners from Jerusalem: "I am the voice of one crying in the wilderness, 'Make straight the way of the Lord' . . ."

The story of the new finds actually begins in the spring of 1947, when an Arab shepherd—chasing a goat, one version says—stumbled upon a cave he'd never before seen and found a number of covered jars. These held nothing but crumbling scrolls wrapped in linen, so the shepherd and his companions—all of them Bedouins of the Ta'amireh tribe—handled them with no particular care.

Tribesmen Went to Bethlehem

One market day, though, the tribesmen took the scrolls up to Bethlehem, some 20 miles off, and showed them to a merchant who happened to be a member of the Syrian Orthodox Church. He sent them to Jerusalem, where the Archbishop later bought some of the scrolls.

Other leaders in his church, several antique dealers, and two visiting European scholars assured him the scrolls could be of no great age, but he got more welcome news from the American School of Oriental Research, which is supported, together with a school of the same name in Baghdad, by 60 American universities, colleges, and seminaries.

Dr. Trever Unrolled the Scroll

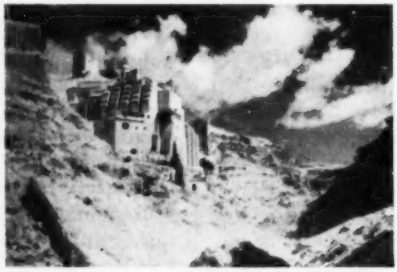
It was Thursday afternoon, February 19, 1948—and cold in the school because the Arab-Jewish war had cut down fuel supplies—when Dr. John C. Trever, the acting director of the school, now professor of religion at Morris Harvey College, laid the largest of the scrolls on his bed and began unrolling it.

What he thought he saw he could hardly believe. There was a box of slides on his desk to illustrate a lecture on "What Lies Back of Our English Bible?" and he thumbed through these till he came to the section on early Hebrew manuscripts. One picture showed part of a Biblical text from the ninth century; the scroll on the bed was obviously far older. Another picture showed the so-called Nash Papyrus, containing the Ten Commandments and a few other verses from Deuteronomy. The Nash Papyrus

was only a fragment but it dated back to the first or second century B.C. and was the oldest copy of a Biblical work that had come down to us in the original Hebrew. Trever looked at this picture of it and then at the newly found scroll: the writing was strikingly similar.

The large scroll, almost 24 feet long, proved to be a copy of the complete book of Isaiah, and further study the next few days convinced Trever and a colleague, Dr. William H. Brownlee, that it was at least as old as the Nash Papyrus. With the Archbishop's permission, he photographed it, column by column, and rushed prints to Dr. W. F. Albright of Johns Hopkins University, a leading authority on ancient manuscripts. Albright wrote back: "The greatest manuscript discovery of modern times! . . . What an absolutely incredible find!"

Some scholars considered the find literally incredible. They said the manuscripts looked much like those written in medieval times, and one suggested, further, that they might have been stolen from some library.



SCENE ABOVE is typical of country in which the Biblical scrolls were discovered by Bedouin tribesmen.

Several sciences combined, however, to refute the doubters. Archeology established that the jars in which the manuscripts had been stored were similar to other pottery used in the first century of the Christian era. Paleography, the study of ancient writing, established that the script of the Isaiah scroll most nearly matched the script used by Hebrew copyists of approximately the second or first century B.C., while the script of most of the other documents was somewhat more modern, coming down into the first century A.D. (One document, a fragment of the book of Leviticus, looks as if it might have been written as early as 600 B.C., but in this case there is a suspicion that the copyist was trying to give his writing an antique appearance.)

Then in 1951, Dr. Willard F. Libby, University of Chicago radiochemist who developed the radioactive carbon 14 method of dating organic material, tested a sample of the linen in which some of the scrolls had been wrapped and reported a date of 33 A.D., with a margin of possible error of 200 years either way (PSM, Dec. '51, p. 98).

One Scroll Has Not Been Opened

Among the scrolls discovered in 1947, besides Isaiah, one has been identified as a commentary on the Old Testament book of Habakkuk; one as a Manual of Discipline, containing rules and ceremonies of the sect that owned the manuscripts; and another as a collection of Songs of Thanksgiving.

There is also a scroll that hasn't been opened yet but that Dr. Trever, judging by a fragment of it, believes is an account purportedly written by Lamech, the father of Noah.

The fighting in the Holy Land made it impossible to follow up the Bedouins' discoveries until 1949. Since then Harding and archeologists from the École Biblique, the Palestine Museum, and the American School—sometimes ahead of and sometimes behind ransacking tribesmen—have found 40 or 50 other caves. All contained pottery fragments; some held pieces of manuscripts.

Caves 12 miles south of Khirbet Qumran have yielded documents that suggest when the end came to the Jewish settlement in this general area and why. One is a marriage contract dated in the seventh year of the reign of the Roman Emperor Hadrian, which was 124 A.D. Two others are letters from Simeon ben Kosibah to one of his generals, Yeshua ben Galgoleh. It was Ben Kosibah who led the Jews' second, and last, revolt

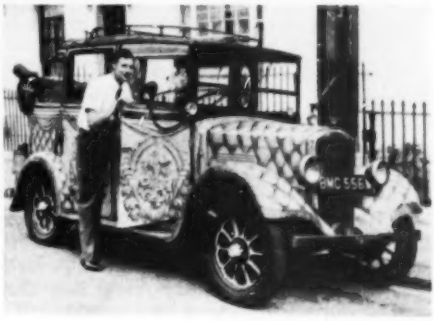
[*Continued on page 248*]

Swimmer Hoists Her Own Jib and Makes Like a Sailboat

Mrs. Wynne Owen Smith, an English swimming instructor, serves as her own streamlined hull when she wants to do a little yachting. Hoisting sail, she takes off with the mast strapped to her middle. She trims sail with her teeth and feet.

Artist Customizes a Taxi

Roy Alderson, a London muralist, did the eye-catching paint job on the old taxicab at right. Hood, fenders and most of the body now look like pink quilted satin while floral medallions decorate the doors. To top things off, the body is framed in yellow and wears a set of painted green drapes. The job took three months.



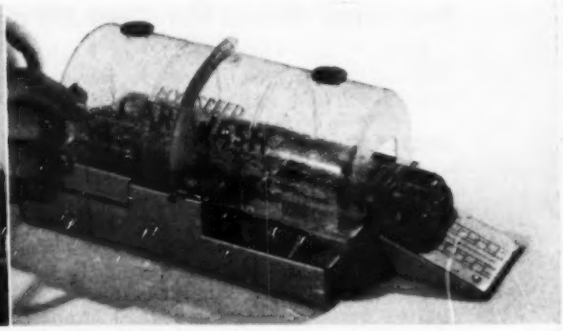
▶▶▶Licking the flaps of bank-by-mail envelopes used by one California bank is no chore—the glue is peppermint-flavored.

NEW TOYS

Santa favors blocks and models this year.

1. Changeable blocks let a youngster build four different structures by exposing different sides of the blocks. When bored with the fire house, the little girl above can turn the blocks into a colonial home, a service station or a log cabin.

2. Hollow cardboard blocks are big enough to train a baby to grip large objects, strong enough to support 100 pounds, light enough to be tossed safely. Sold flat, they can be put together by a six-year-old.

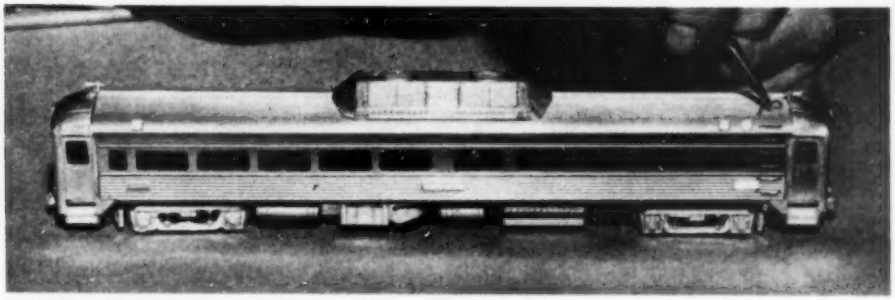


3. Car Wash sprays plastic automobiles as they ride through on a lever-actuated belt. No water gets on the floor—a pan in the base catches it from the nozzle and stores it for re-use.

Further information can be obtained from: 1. Gaston Mfg. Co., 234 W. 2nd St., Cincinnati; 2. BRRR Products, Hasbrouck Heights, N. J.; 3. Ideal Toy Corp., 200 Fifth Ave., NYC.

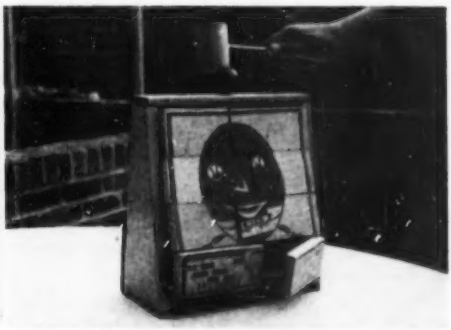
4. Tractor is a scale model of an International diesel. Pushing levers on the 110-volt control box makes it turn, climb, push, pull, reverse or bulldoze. Rubber treads protect floors for indoor play.

5. Coaling station tilts an operating dump car's load into an elevator, which hoists it to overhead position, then empties it into waiting car and descends for a new load. For O- or O27-gauge track.



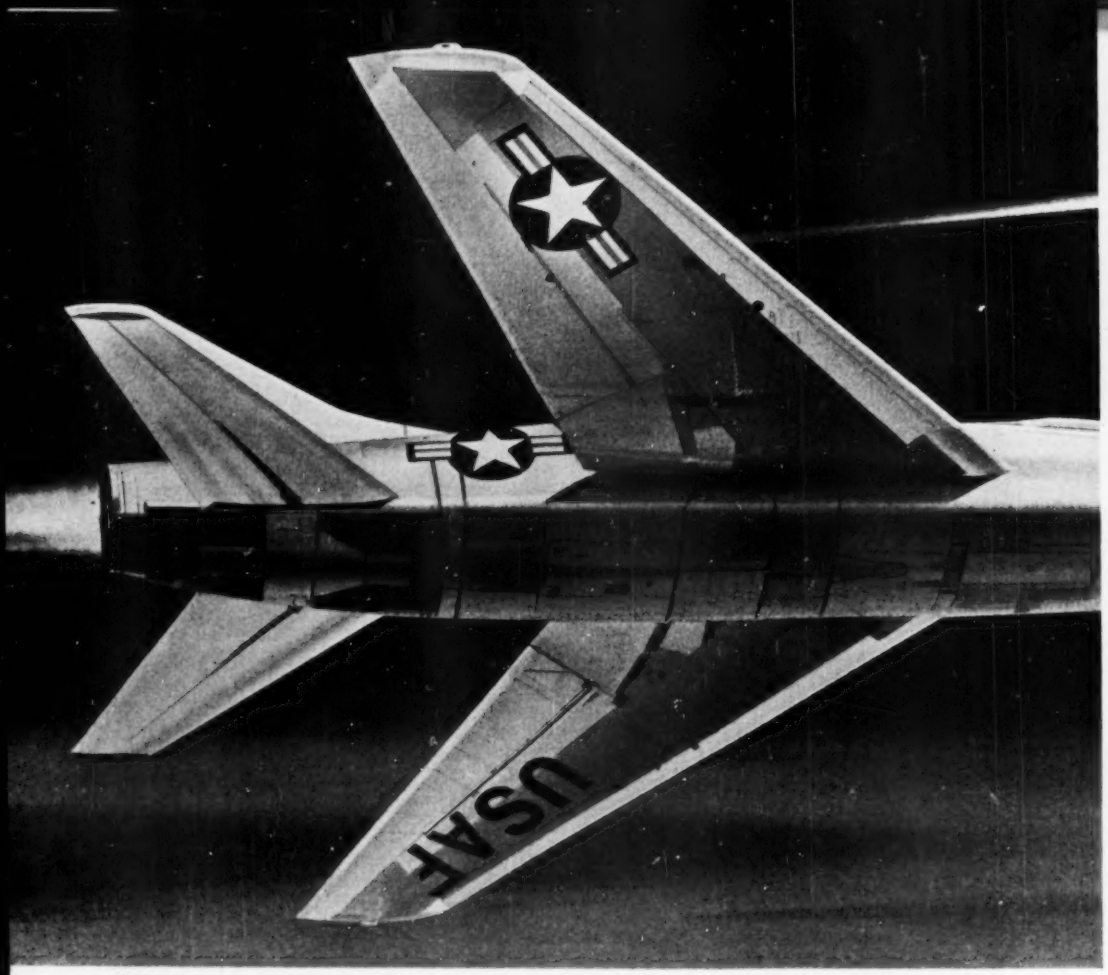
6. Kit-built model of self-propelled rail diesel car has electric motor connected directly to the drive wheels, as in a real Budd RDC. Ten inches long, it can haul three coaches. Truck and motor can be removed, serviced and reinstalled in two minutes.

7. The old tin whistle isn't tin any more and it does a lot more than whistle—it's an action toy, too. As a child blows into the mouthpiece, a tiny airplane makes a perfect loop around a plastic circle.



8. Tumble-down blocks channel destructive impulses into constructive building. A mallet knocks the stacked pieces apart. Children two to four can easily put Humpty Dumpty together again for another whack.

4. Product Miniature Co., 2240 S. 54th St., Milwaukee; 5. Lionel Corp., Irvington, N.J.; 6. Irvin Atheatn, 11929 Southwestern, L.A.; 7. Elmar Products, 15 W. 24th St., NYC; 8. Childhood Interests, Inc., 200 Fifth Ave., NYC.



More jet power, more sweep of wing, and a low-drag fuselage make the F-100 the swiftest

With the F-100 Super Sabre jet now in production,

By Herbert O. Johansen

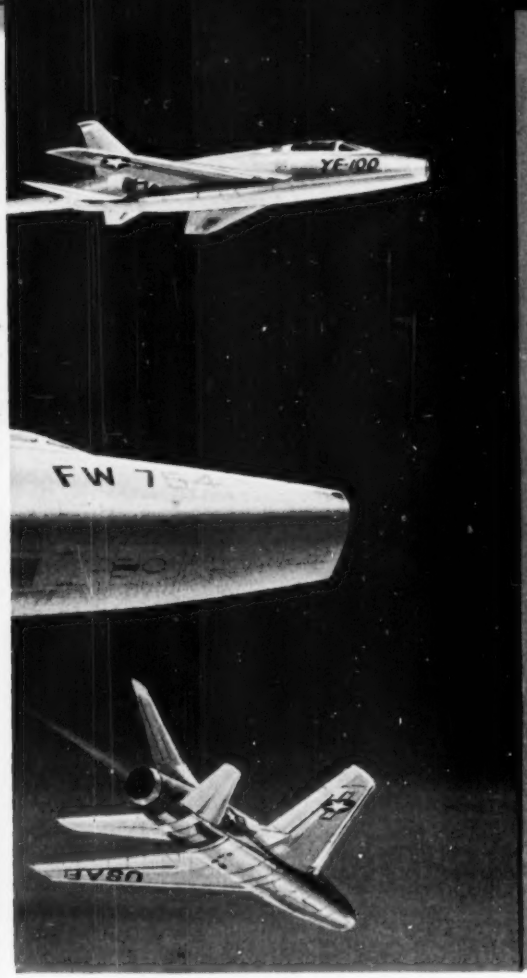
THE "Y" has been taken off the North American YF-100 jet fighter.

That means it is no longer experimental, that the U. S. Air Force now has in production the world's fastest fighter—one that can *sustain* supersonic speed *in level flight*.

We—and the British, and probably the Russians—have for some time had jets that were *capable* of faster-than-sound flight in dives accompanied by the sensational sonic bangs or, perhaps, in brief supersonic bursts boosted by jet afterburner. But the F-100 is a new breed of plane—it is supersonic in level flight. It is built and powered for supersonic flight as routine operation—not just as a stunt or an all-out record-setting, headline-making effort.

A Whole Supersonic Air Force

The F-100 is a milestone, marking the coming-of-age of the jet age—the first in a series of new faster-than-sound fighting airplanes. Among these are the Air Force's McDonnell YF-101 twin-jet Voodoo long-range bomber escort; the Convair YF-102 delta-wing fighter; Republic's



This Is the Fastest Fighter in the World

fighter plane in our air arsenal.

the Air Force gets a truly supersonic weapon.

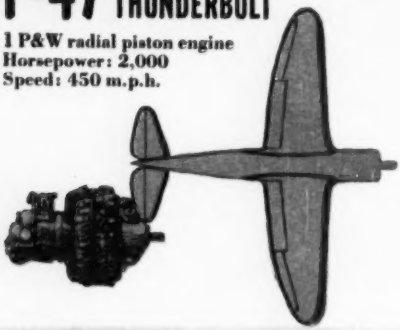
XF-103 research fighter and YF-105 fighter-bomber; Lockheed's YF-104; and for the Navy, the Douglas XF4D-1 Skyray delta-wing fighter (which in recent tests flew faster than 760 m.p.h.), the Grumman XF10F-1 Jaguar variable-sweep-wing fighter, and the McDonnell XF3H-1 Demon.

Some of these newcomers have been flown, some are being built and others are still on paper. Some may not get into production as better and faster models develop from lessons learned. But as the Ys-for-experimental drop off, our military air forces become truly supersonic. A

BIG INTAKE at nose lets F-100 gulp vast amount of air needed for supersonic speed.

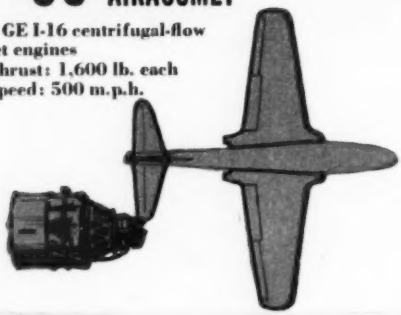
P-47 THUNDERBOLT

1 P&W radial piston engine
Horsepower: 2,000
Speed: 450 m.p.h.



P-59 AIRACOMET

2 GE I-16 centrifugal-flow jet engines
Thrust: 1,600 lb. each
Speed: 500 m.p.h.



THICK, STRAIGHT WING, stubby nose, protruding guns, bulging canopy of World War II Republic Thunderbolt would have acted as drag brakes at speeds that jet makes possible.

JET POWER made its U.S. debut in this Bell P-59 Airacomet that first flew in October 1943. Absence of propeller enabled designers to clean up the fuselage.

daytime fighter, the F-100 is a gun platform. Its main mission is to destroy enemy fighters over enemy territory to give us not only air superiority but the *control of the air* we would need during those last critical miles as an A-bomber neared its target. For that job it must be able not only to fly high and fast, but for long distances, which means great loads of fuel. So it is big; and, since it is big, it can carry under-wing loads of bombs or rockets for a secondary mission as a low-level air-ground attack weapon. Such external loads would necessarily slow the plane down, but once the load was dropped, the F-100 could fight its way back to base at supersonic speeds.

More Wing Sweep Increases Speed

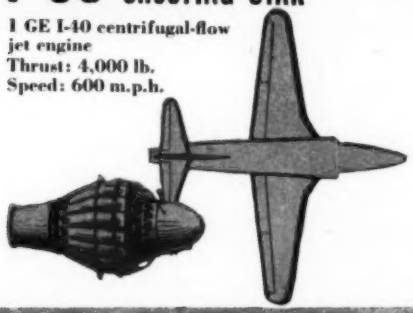
Although it is an evolution of the F-86 Sabrejet that has broken many speed records and made aerial-combat history over MIG Alley in Korea, the F-100 Super Sabre is a new plane. That it is supersonic would mean that it can fly faster than sound at all altitudes, which varies from 660 miles an hour at a combat altitude of 40,000 feet to 762 miles at sea level. Bigger than the F-86 fighter, the F-100 is 45 feet long and weighs more than 20,000 pounds.

Most notable change is in the wing. Where the latest F-86 has 35-degree sweep, the F-100 has a thinner wing that is swept back 45 degrees. The tail also has more sweepback.

Power behind the F-100 is a new design in jet engines, the split-compressor J-57, claimed by the manufacturer, Pratt & Whitney, to be the most powerful production engine in the world. With it, the Super Sabre is reported to have more

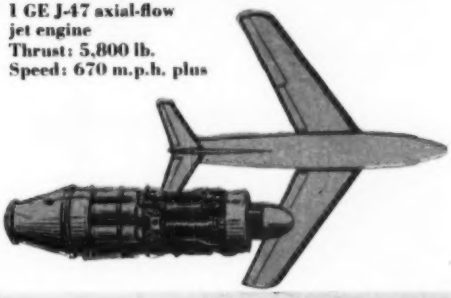
F-80 SHOOTING STAR

1 GE I-40 centrifugal-flow jet engine
Thrust: 4,000 lb.
Speed: 600 m.p.h.



F-86 SABREJET

1 GE J-47 axial-flow jet engine
Thrust: 5,800 lb.
Speed: 670 m.p.h. plus



FIRST OPERATIONAL JET FIGHTER, the Lockheed F-80 Shooting Star, met Red MIGs in combat in Korea. Although the wing is still straight, it is much thinner for less drag.

AS MORE POWERFUL JET ENGINES enabled planes to nudge the speed of sound, designers were forced to sweep back the wings, as in this North American F-86 Sabrejet.

than 10,000 pounds of thrust and about 15,000 pounds with afterburner (the F-86D has 7,600 pounds of thrust with afterburner).

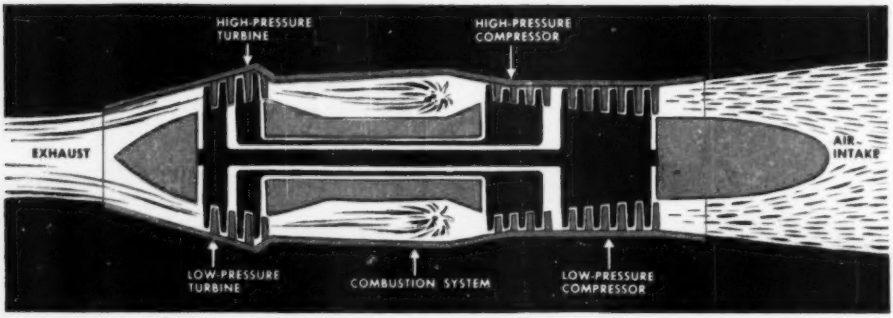
Split-compressor, or twin-spool, means that an engine has two compressors in series, each driven by a separate turbine. There are two shafts with no mechanical connection between the two turbines. The first (low-pressure) compressor feeds the second (high-pressure) compressor. The result is a higher range of compression ratios than can be obtained on a single-shaft compressor.

Jet Speeds Bring New Designs

Among the advantages of the split-compressor are lower fuel consumption for range or higher power output for speed and maneuverability; the elimination of "surging," or back-flow, problems in the thin air at high altitudes; easier starting, and fast acceleration.

As jet engines became more powerful, new fuselages and wings were designed around the engine, and the early Lockheed F-80 Shooting Star and the Republic F-84 Thunderjet were born. Wings were still straight, but streamlining sent speeds up 100 and more miles an hour. Then jet-engine power went up and greater speeds forced the designers to go to thinner and swept-back wings to delay drag and the turbulence that wings run into at transonic speeds.

Ever-increasing jet speeds have posed other problems. When our first jet plane, the experimental Bell P-59 Airacomet, was announced in 1944, the Air Force thought it had the makings of a simple, lightweight fighter that would burn almost anything as fuel. Kerosene was it—



Principle of split-compressor jet engine that powers the F-100 is shown in drawing above.

at first. Disillusionment came fast—as fast as speeds increased. Jet engines had to abandon kerosene for gasoline, and today that has had to be replaced by special, high-grade JP fuels.

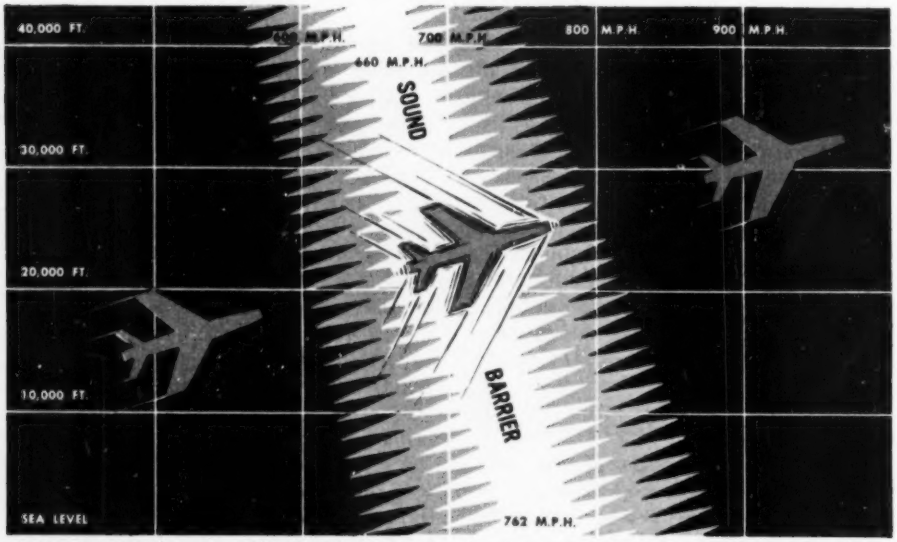
Then there was the matter of weight. After all, a jet plane is only a shell built around a blowtorch. Nothing complex about that. But again, greater speeds and more powerful engines changed the picture—there was the pilot to consider.

Pressure suits enabled him to take the terrific Gs at jet speeds, but he must also fly and fight at high altitudes to take advantage of lower fuel consumption. That meant a pressurized cockpit and an improved oxygen system to keep him alive should the pressurization fail.

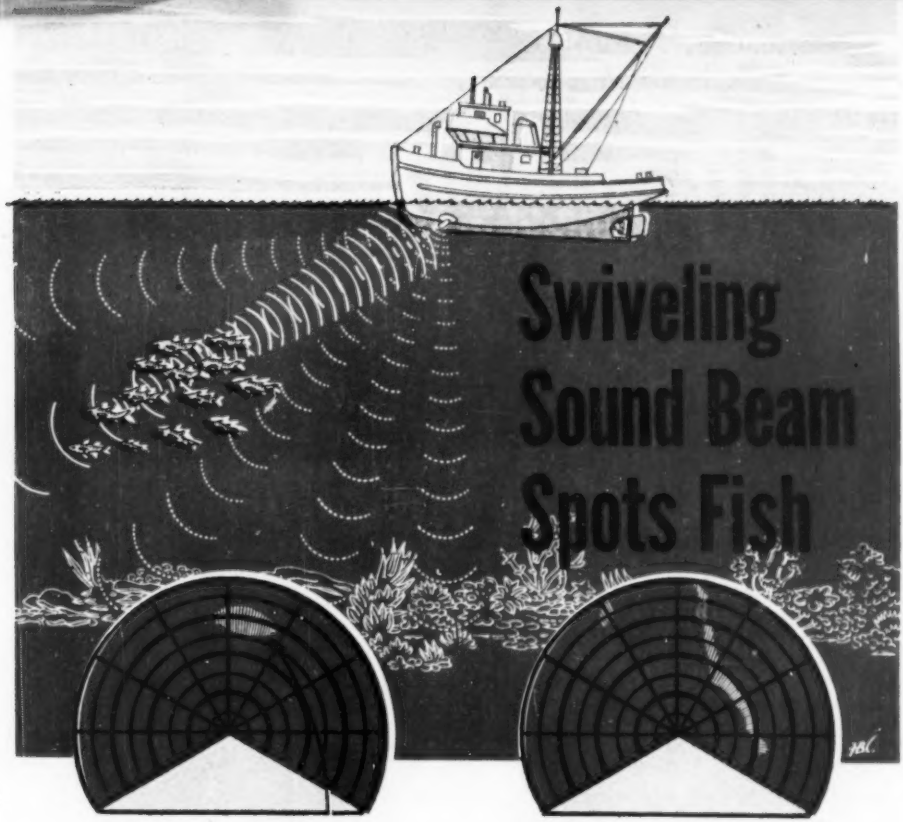
Heat created by friction necessitated refrigeration of the cockpit, and because it is bitter-cold up there, heaters had to be provided to prevent guns from freezing. Add to this an ejection seat for the pilot in case of bail-out, computing radar gunsights and power controls, and you have what is mildly called "complexity."

Now that the Air Force has hit the supersonic, the question arises, "How much faster will we fly?"

Top fighter men in both the Navy and the Air Force say, "At least 100 miles an hour faster than the enemy." END



SPEED OF SOUND varies with altitude. Critical speed area is the transonic where the airframe runs into violent turbulences. At supersonic speeds air becomes smooth again.



A SCHOOL OF HERRING looks like a football on Sea Scanar's screen. This school is 150 feet down, 10 degrees to starboard.

OUTLINES OF A CHANNEL detected by Sea Scanar. Screen indicates 240-degree scanning range, but beam's automatic swing is 180.

UNDERWATER "SEARCHLIGHT" that can shoot narrow beams of sound waves to port and starboard, up and down, protrudes from hull. Hoist raises it into a well when not in use.

A NEW type of sonar, sweeping the sub-surface like a searchlight, probes the dim depths ahead and on both sides of a ship as well as beneath it. Sonar units of earlier design have been able to beam their tiny, rapid bursts of high-frequency sound in only one direction—straight down. This has limited their usefulness.

Sea Scanar, as the latest sonar is called by its makers, Minneapolis-Honeywell, has already been tried out with considerable success by professional fishermen. And it is expected to become an important navigational aid as well.

The echoes it receives as its beams of sound waves hit fish, floating logs, reefs, piers and sand bars are visible on a radar-type screen and audible in a loudspeaker. A fish sounds different from a sand bar, a reef from a log.

Sea Scanar is so sensitive that it has picked up the faint, bubbly trail of a line of swimming ducks at 400 feet.

Plug-In Workman Built in 90 Days

Garco, newest in a long line of man-made men, can do homely tasks now but is cut out for more dangerous duties.

By Andrew R. Boone

GARCO, a mechanical man recently "born" in a California garage, can saw, hammer, drill, mix chemicals, pick up papers, stack boxes, roll his eyes and have the shakes. He can also play chess.

In this last accomplishment he resembles a sensational robot of about 200 years ago. That celebrated member of the ancient mechanical family, dressed like a Turk, was the rage of Europe. He played chess with Catherine the Great, Frederick the Great, Benjamin Franklin and Napoleon. He even had the temerity to sweep the board clean after Napoleon had made three wrong moves.

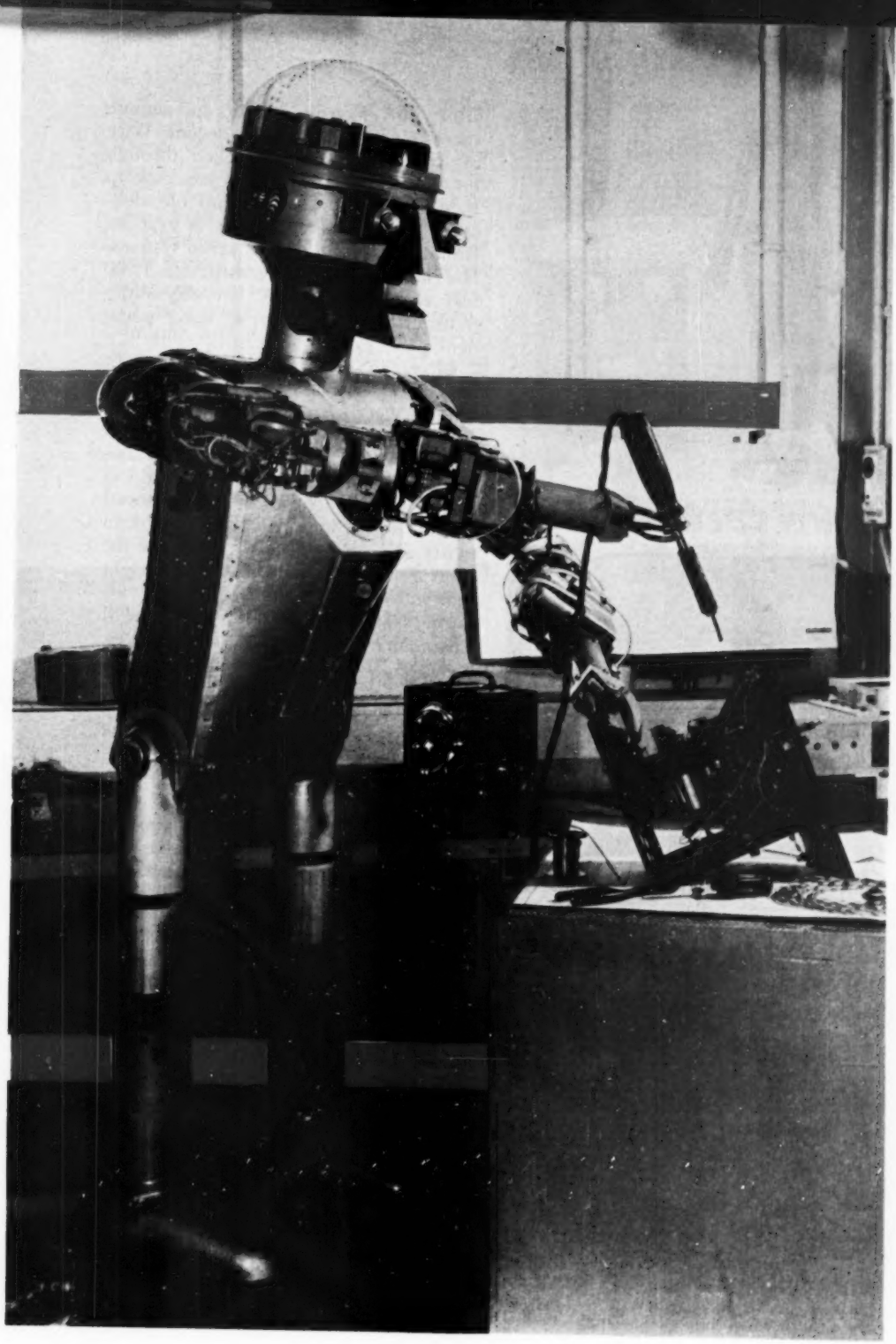
Years after these worthies were dead and gone, some bright-eyed boys discovered that a small, skinny, unmistakably human man hid out in the boxlike chest under the chessboard and worked the levers that made the "mechanical" man seem so clever.

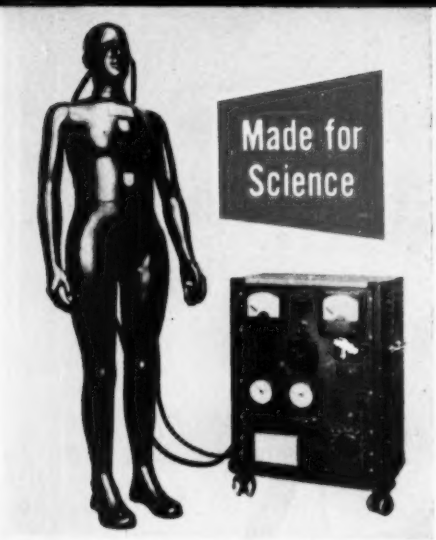
HOW GARCO SOLDERS and does other chores is shown here. His right arm duplicates each movement of the mechanical arm that his creator, Harvey Chapman, is seen manipulating above. His left arm is worked by push-button controls.

Made of Discarded Plane Parts

Garco, latest in a distinguished line of man-made men, is a lot cleverer than this fraudulent Turk, but he needs human direction, too. He gets it, through a control arm and push buttons, from Harvey Chapman, an engineer for the Garrett Supply Co. of Los Angeles, Calif. Chapman created Garco in three months, in his garage. The 90-day wonder was put together and made animate with discarded airplane parts.

Garco is a well-oiled creature of Convair gear trains, Constellation electrical actuators, and DC-6 cabin-pressure regu-





"SLEEPY JOE," electrically heated copper man made by GE, tests flying suits for Air Force.

"RED FREDDY," built by the Navy, bleeds dyed water in four places to help teach first aid.

ANONYMOUS HEAD, made by GE to test oxygen masks, heats up, sweats and breathes.

lators, plus electronic circuits and enough sheet metal to make him decent. With the aid of a vacuum applied through his rubber-tipped fingers, he can pick up light objects with commendable delicacy. His brain is electronic, a neat accumulation of six aircraft servo systems. His nervous system consists of 1,200 feet of wire cable. A two-way radio transmitter enables him to make pertinent remarks.

Chapman brings Garco to apparent life by first opening the circuits and sending electricity surging into the complex metal body. He then lays his right arm along a five-jointed electromechanical control arm, which has a handgrip at the end of it. The joints can be moved up and down, in and out. As Chapman twists and turns his own arm—and the control arm along with it—Garco's right arm moves in exactly the same way. Garco is so sensitive, in fact, that if Chapman's hand shakes, Garco's does, too.

Electronic Miracle

What happens is a minor miracle of electronics.

As the joints in the control arm move, through six electric channels they notify sensing devices in Garco's electronic brain that they have disturbed the balance in as many Wheatstone-bridge systems. The disturbance of each fires an electronic tube, which in turn fires a relay tube, which actuates one of the five .05-horsepower motors in Garco's right arm.

So much for the right arm. Garco's left is manipulated by 22 push buttons, mounted on the case of the control arm.

The push buttons, in addition to working Garco's left hand and arm, move the robot's jaws and lips, increase his height six inches, roll his plastic eyes and enable him to bow at the hips.

Both of Garco's arms contain five tiny actuator motors. Three apply torque, representing the ball joints of a man's shoulder and elbow; the others, taking the place of tendons, apply linear push and pull.

Most of the mechanical men of history—and they go all the way back to Daedalus, who, if we can believe Plato, created statues that had to be tied down to be kept from running away—have been built as stunts.

About the only exception was a fabulous man of clay that Albertus Magnus, back in the thirteenth century, spent 30 years putting together. When he got through with it, the creature supposedly was able to walk, talk, answer questions intelligently and solve problems. But Thomas Aquinas, a pupil of Magnus and a youth with a wholesome fear of the Devil, attributed the clay man's gifts to the Evil One, and smashed it.

Magnus apparently was a man of awesome self-restraint. All he is reported to have said was, "There goes the work of 30 years!" But he said it in Latin, and the report may have gotten garbled.

Almost all other recorded mechanical men have been built to amuse and amaze the public and, directly or indirectly, make money for their creators.

Robots for Science

In recent years, however, some have been built for scientific purposes.

General Electric, for example, developed an electromechanical head for testing oxygen masks at sub-zero temperatures, and a mechanical hand for fiddling with "hot" materials at Hanford and other AEC plants.

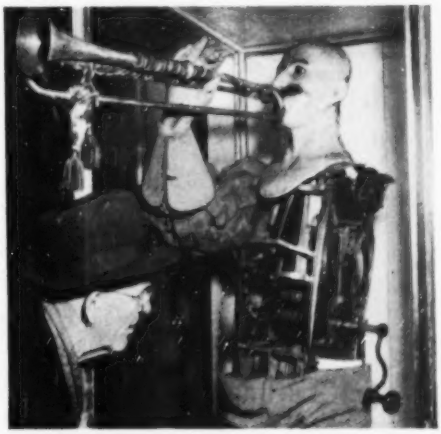
What's the justification for Garco? Well, he started out as a stunt, too. But Chapman thinks he should be taken a lot more seriously than that.

Why not, he asks, use creatures like Garco to do a lot of the highly dangerous but necessary jobs that more perishable men now do? For instance: mix the ingredients for experimental explosives, handle deadly bacteria and fungi, weld and salvage under water.

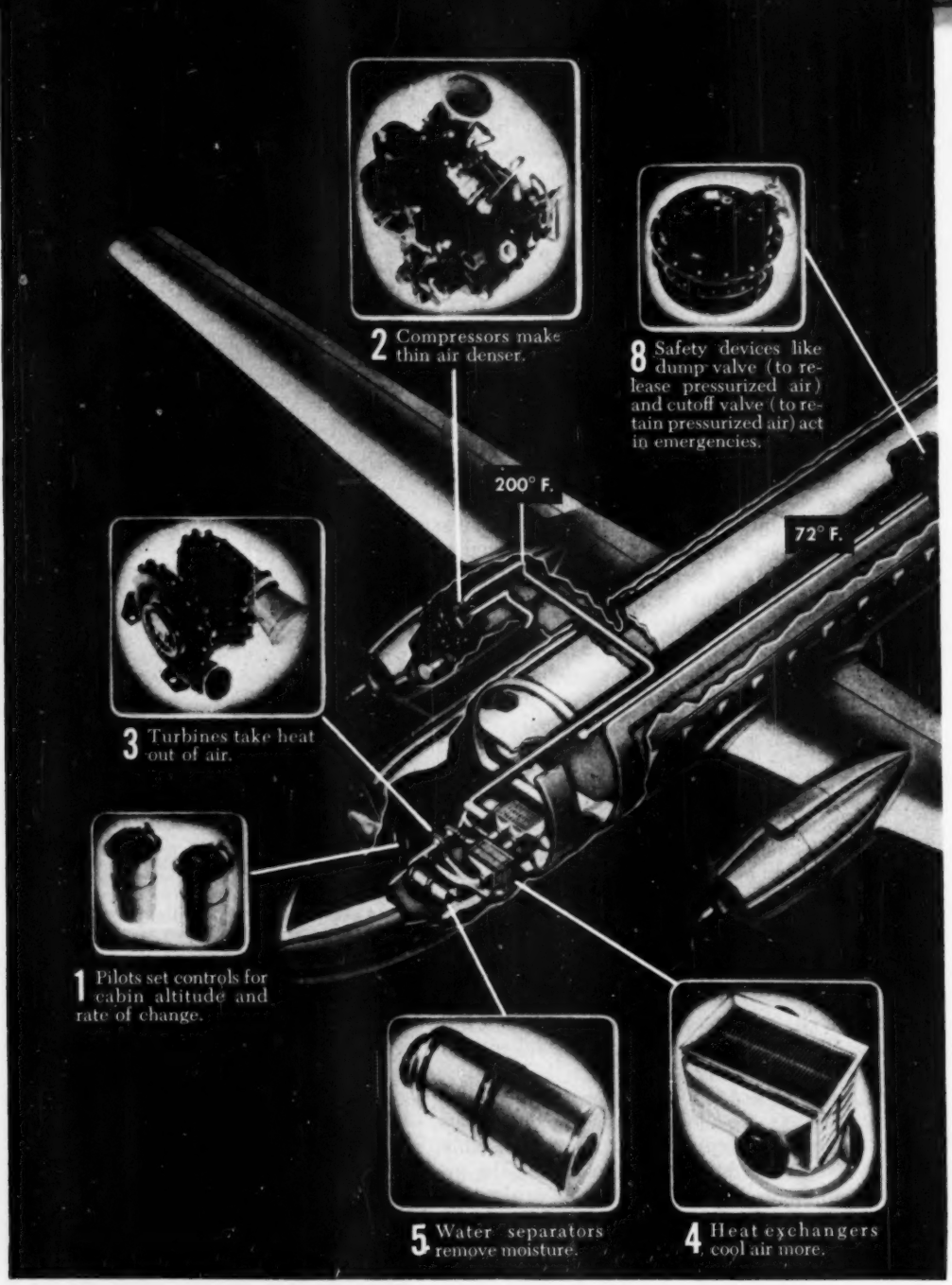
Robots of Garco's stripe, Chapman suggests, could also braze titanium in a vacuum, work under any degree of atmospheric pressure, handle radioactive stuff—even pilot the first rocket to the moon. END

COLD-HEARTED SIREN, run by electric mechanism and radio, haunts Minnesota river.

QUARTER-TON ROBOT, directed by radio, manages to ruffle a German cab driver.

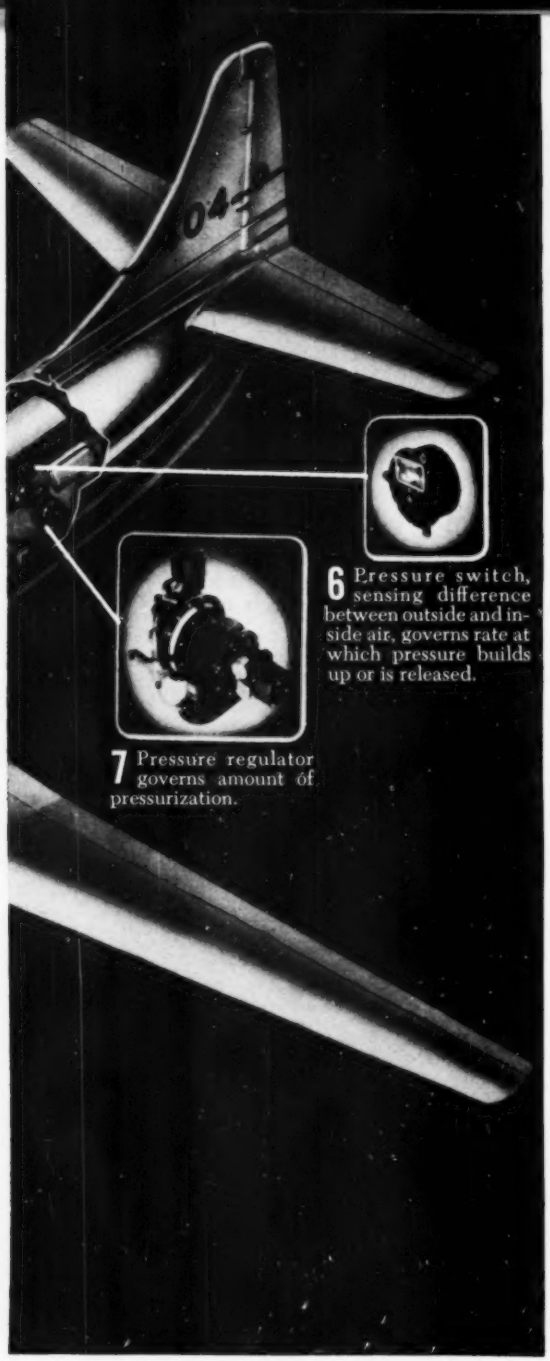


HAND-CRANKED BUGLER, made in Germany in 1810, reveals bellows that made him toot.



AN AIRLINER'S pressurizing system has three major parts—controls, air-compression and distribution components, and safety devices. Pilots set dials for altitude where system will start operating and for rate of change. Temperature control is set like home thermostat.

Compressed air from turbines is forced to turn the cooling turbines which rob it of heat. Heat exchanger, bathed by outside air, cools captive air even more. Moisture is removed from it by centrifuge, baffles or filters. Rate of change in pressure is regulated by diaphragmed bellows, responding to difference between pressure of outside and in-



side air. It sends commands by electric circuit to regulator valves. Amount of pressure is regulated by bellows-and-diaphragm or spring-loaded valve sending electric signals to a pressure-limiting valve. System shown uses auto-type slipping clutch in compressors to change rate at which air is pressurized.

How You Fly High in Comfort

ALL over the world each day tiny islands of pressurized air float around in a vast sea of atmosphere too thin to sustain human life. These are the cabins of modern airliners, flying from four to eight miles above the earth.

The airliners are pressurized automatically. They are depressurized automatically for landing. The crews dial what pressures and rates of pressurization they want. A big family of mechanical and electrical gnomes do the work.

The gnomes even react to emergencies. If the depressurizing system should fail on landing at mile-high Denver, for instance, passengers could be blown out the door as the locks were unfastened. But a gnome on the landing gear spills the high-density air from the cabin.

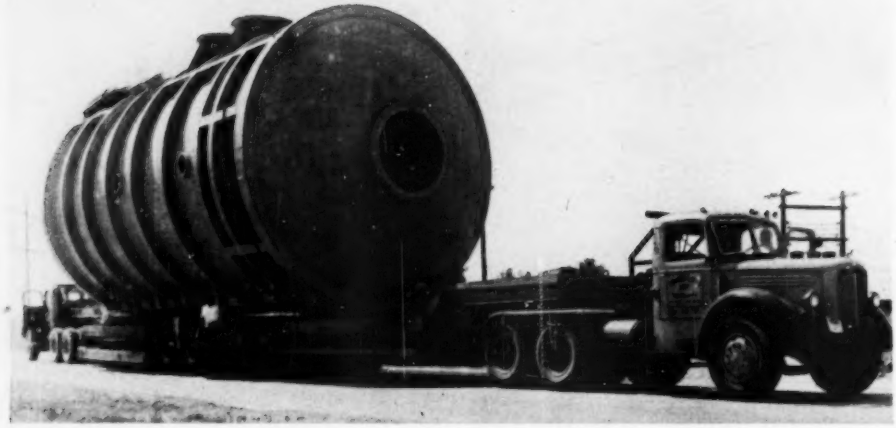
Another gnome retains pressure in the cabin if the pressurizing system gets out of order. Still another heats or cools the air as passenger comfort demands.

One of Several Systems

Pictured here is a typical airplane pressurizing system. Several systems are in use. This one is made by the AiResearch Manufacturing Co. of Los Angeles. Among its components is a slipping clutch borrowed from the Ford automobile's automatic transmission.

Pressurizing systems are complicated, but their principle is simple. A turbine-type compressor, engine-driven, takes the thin air at high altitudes and thickens it. In the process, the air gets hot. So, depending on temperature demands for passengers and crew, it may have to be cooled. It's also dehumidified.

The next time you fly and escape the discomfort of having your ears "pop" when you land, credit the gnomes of the pressurizing system. END



Moving Day for 117 Tons Has Tractors Working Back to Back

WHAT looks like a huge water tank loaded on the trailer above is a 48½-foot-long, 117-ton test cell for putting jet engines through their paces. Two Mack tractors with six wheels each—one pushing, one pulling—and a pair of heavy-duty low-bed trailers hauled it through Indianapolis streets to deliver it to the Allison plant.

Steering Post Bends Up in Crash

A NEW French steering column is intended to cut the chances of smashed ribs in car collisions. When the driver is shoved forward, the pressure pushes the wheel forward, too, until the swivel-jointed column is upright as shown above. The movement also automatically cuts off the ignition.

How Many Fleas on a Squirrel?

THE squirrel above is being de-fleaed to test a parasite-killing insecticide. Any bugs the vacuum cleaner misses are gathered with tweezers—and the count shows how good the flea-killer is. The College of Medical Evangelists, Loma Linda, Calif., is running the tests for the Army.

By Bill Kreh

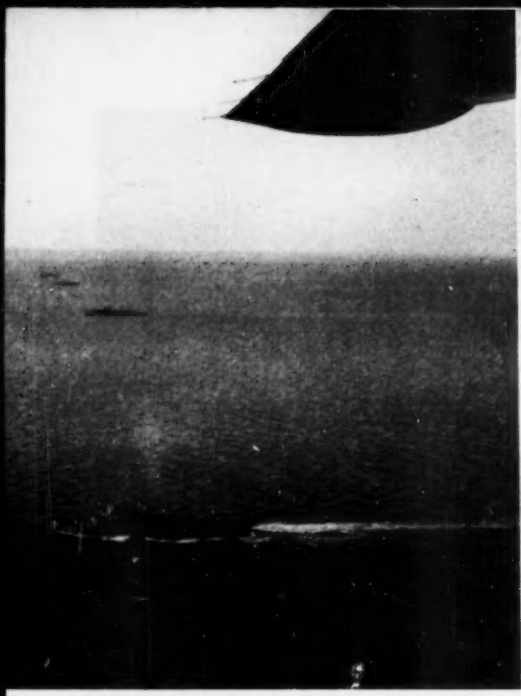
Event One Thousand!

When a sub lies helpless on the sea bottom, men with the diving bell rush to the rescue.

INSIDE the radio shack of the submarine tender USS *Gilmore*, at Key West, Fla., a Navy radioman pounded out a message:

> COMMENCE EVENT ONE THOUSAND X SUBMARINE SENNET X LAST KNOWN POSIT OFF AMERICAN SHOALS ON COURSE 090 AT FOUR KNOTS AT 1900 X COMMENCE SEARCH X . . .

Three words in the message—EVENT ONE THOUSAND—meant that a sub-



1 HUNT BEGINS in blue waters off Key West as surface ships search for submarine *Sennet* in EVENT ONE THOUSAND drill. A Navy blimp also participates.

2 DIVING BELL, to be lowered onto sub's hatch, is prepared by crew of USS *Petrel*, submarine rescue ship. To give clue to location, sub emits noises.

marine disaster might be in the making.

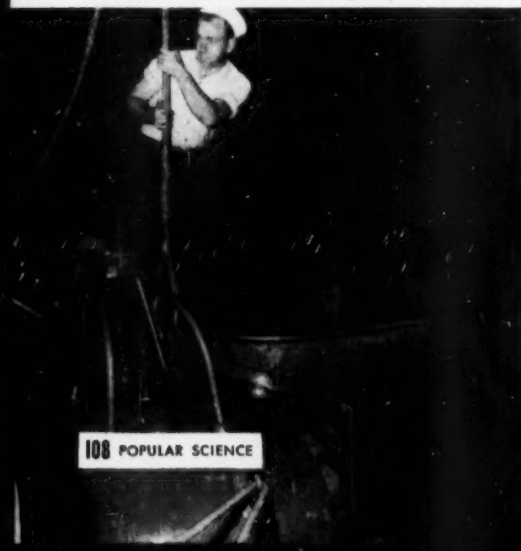
The search-and-rescue sequence that the radio message set in motion is shown in the accompanying photographs.

This was only a drill, but no drill the Navy holds has more overtones of grimness than the search for a "missing" sub.

Soon, aircraft, surface ships and even other submarines were off on the hunt.

Using the latest in sonar and radar, the search continued into the night. When a positive contact was made with the *Sennet*, the rescue vessel USS *Petrel* went into action. Nine hours after the

5 DIVING BELL is lowered into water from deck of *Petrel* before being cast loose for descent. Weighing 10½ tons, bell carries two crewmen, can rescue eight men at once.



6 BELL is now secured to *Sennet*. One of "rescuers" from *Petrel* opens air lock in base and enters submarine through hatch. Bell can go to any depth a sub can.

3 MESSENGER BUOY, sent up by *Sennet* to show position, is retrieved by *Petrel's* crew as first step in "rescue." Diver will follow buoy's cables down to submarine.

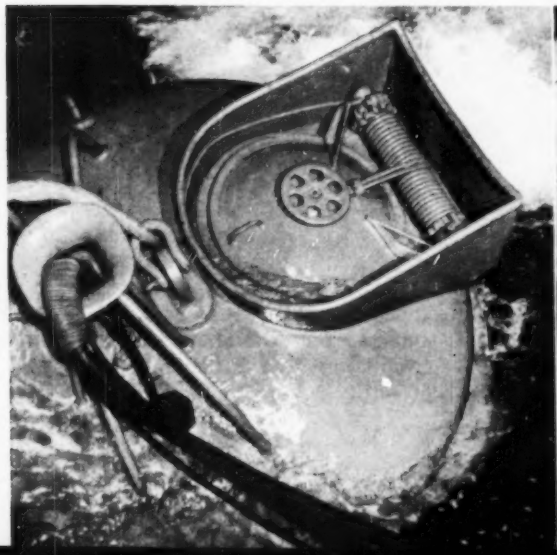
4 DIVER is readied for plunge to ocean bottom. He will connect the other cables that will guide rescue bell to *Sennet's* hatch. Bell's buoyancy can be altered at will.

Sennet had been reported "overdue," her crew was "rescued."

Actually, as this was written the U.S. Navy hadn't made a real-life submarine rescue since 1939, when the *Squalus* sank off Portsmouth, N. H. Thirty-nine of her men were rescued, and the *Squalus* was raised to fight in World War II as USS *Sailfish*.

But as long as there's a submarine operating under the sea, there's the threat of sudden disaster. To meet it fast, the Navy keeps constantly in trim by drills like Event One Thousand. END

7 BELL BREAKS WATER after being detached from sub to complete first round trip. Drill is precautionary. Navy has not had sub rescue job since *Squalus* sank in 1939.



8 FIRST "SURVIVOR" from *Sennet* climbs out of diving bell. Submarine rescue vessels like *Petrel* usually are within easy sailing distance of any fleet of U.S. subs.

Studebaker Joins Wagon Train with 1954-Model Conestoga

Better brakes, glossier interiors, and a new entry in the hot station-wagon fight, mark next year's line-up.

By Frank Rowsome Jr.

STUDEBAKER is back in the wagon business that launched the company more than a hundred years ago. But the wagon they are making now is scarcely calculated to tote pioneers across the plains. This one lugs the kids to school, hauls plywood back from the lumber-yard, and carries the whole family, including the pup, on vacation trips.

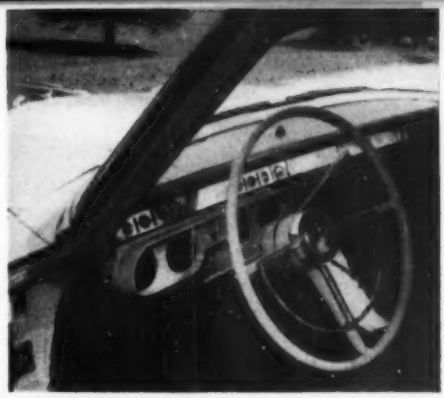
This latter-day prairie schooner, the company's bid for the growing market staked out by the Plymouth Suburban and the Ford Ranch Wagon, is called (more or less inevitably) the Conestoga. On looks, at least, Connie is a comer.

Loewy wagon. Up front, it has the same sloped, downhill lines that made the Loewy-styled 1953 Studebaker such a snaky, "Continental" craft. Beginning at about the door, the lines square out, blending into the same shape that characterizes most current station wagons—that of a miniature and rather sporty hearse. Pert little kickups of rear fend-

ers repeat the rear lines that helped make the '53 car such an eye-popper. For the lady of the house who wouldn't mind cutting a wider swath in suburbia, there are some juicy combinations of color and interior details, guaranteed to green the eyes of other matrons whose wagon interiors are finished in utility-gray fiberboard.

Never a company to let the gewgaws crowd out the gears, Studebaker has also built some solid service into its wagon. It is a two-door, two-seat vehicle, able to carry six persons plus some 32 cubic feet of payload. If you want more space, flip-flop the rear seat so it lies flush with the floor, which gives room for three people and 64 cubic feet of enclosed payload space. If you aren't exceptionally tall, you can spread a sleeping bag out on the 69½-inch-long rear floor. (If you're more than five-nine, try it kitty-cornered, or let your feet sleep out on the tail gate.)

Engineering the wagon. When the Conestoga project came up, Studebaker design people figured they might have to beef up their basic chassis. This turned out to be unnecessary (one exception: frame steel on the six-cylinder job is going to be a few thousandths thicker). The wagon's dry weight checks out at only 170 pounds more than that of a four-door sedan. The Conestoga does carry, however, these changes:

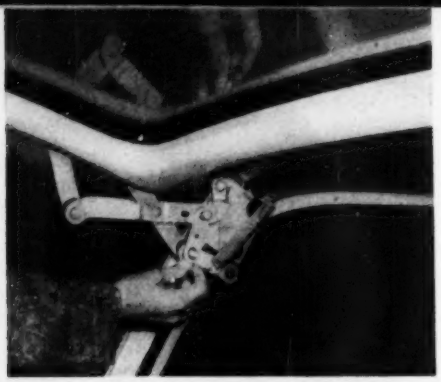


INSTRUMENT PANEL is redesigned with a single shroud over instruments, and has new flat switch toggles. Interior colors and fabrics are going to be extra-luxurious this year.

New rear springs. Standard rear springs, fitted to an experimental Connie, gave a fine ride at moderate loads. When Studebaker engineers piled in a severe overload—some owners will inevitably heave in a passel of cement bags—the Conestoga sat sadly down on its haunches. The answer to that was a special two-stage spring. It has two extra leaves arranged so that they don't come into play until the wagon is heavily loaded. With up to three people aboard,

VERTICAL FINS on grille are the best recognition feature for '54 jobs. The V-8 hood ornament was put on in mid-1953 after Mercedes squawked about earlier Y-shaped one.

FLOP THE REAR SEAT and there's 88½ inches of floor length with the tail gate down. Tailpipe dumps the exhaust in turbulent air behind wheel to lessen chance of any swirl-in.



SPRING partly counterbalances weight of rear window. If you want to drive with it up (in hot weather, a wagon is almost as breezy as a convertible), snap this link over a pin to lock it up. But don't forget to unsnap link before closing window or you'll bend bracket.

the new springs have the same rate as the old ones, and the same easy ride. But when you pile the pounds on the tail gate, she won't squat down like a depressed rabbit.

New shock valving. Having jiggered the springs this way, Studebaker changed the valving on the rear shocks so they'd have a matching damping characteristic. Connie rides well, without that trundling little jowl-shake some wagons have.

Axle and tire options. A Conestoga buyer will have a chance to tailor it to suit his country and his expected service. Depending on the engine he elects (six or V-8), on his transmission (automatic or manual with or without overdrive), and whether or not he lives in a hilly country or wants economy or performance, he may get one of a half-dozen rear-axle ratios. These range from 3.54 to 4.88. If he expects to be lugging heavy loads, larger, extra-ply tires will be fitted.

Other '54 changes. Aside from Connie the rest of the line stays close to '53. There is a new front grille with vertical fins, and bumper guards have been redesigned to overcome an annoying tendency to underride and lock onto other cars. The armrest in the rear of the swanky hard-top coupe has been made removable—not that you can now seat a passenger in the middle, where his tail bone would still clunk inelastically on the drive-shaft tunnel—but a youngster can now stretch out across the rear seat.

Better brakes. The best mechanical news for 1954 is that they've beefed up the brakes. The previous ones got by, but they were hardly distinguished performers. The new ones are bigger, have self-centering brake-shoe pivots, and deliver far better stopping performance.

In the engine department, Studebaker's OHV V-8 has gone from 7.1 compression to 7.5, which was an option last year. This boosts output around two percent, to about 122 or 123 hp. Octane requirements increase slightly, though the engine is still contented with regular gas. (Studebaker doesn't plan to blow any bugles on this power rise.) Other changes under the hood are minor: new linkage to prevent throttle movement on hard turns or panic stops, and a bit more copper in the V-8 radiator.

FACTS ON '54 STUDEBAKER

Model: Commander Regal Station Wagon.

Engine: 90° V-8; 120 hp. at 4,000 r.p.m.; compression ratio, 7.5:1; piston displacement, 232.6 cu. in.; piston travel (in feet per car mile at 20 m.p.h.), 1,637; bore and stroke, 3¾" by 3¼"; torque, 190 lb.-ft. at 2,000 r.p.m.

Weight: 3,368 lb.; per hp. 28.07 lb.

Transmission: standard, manual shift (overdrive and automatic available); rear-axle ratio, 4.09 with standard transmission, 4.27 with overdrive, 3.54 with automatic.

Steering ratio: 33.8-24-33.8 (over-all); radius of turning circle, left, 19¾'; right, 19¼'.

Effective brake-lining area: 173.4 sq. in.

Springs: front, coil; rear, 6 semi-elliptic leaves, 2½" by 50".

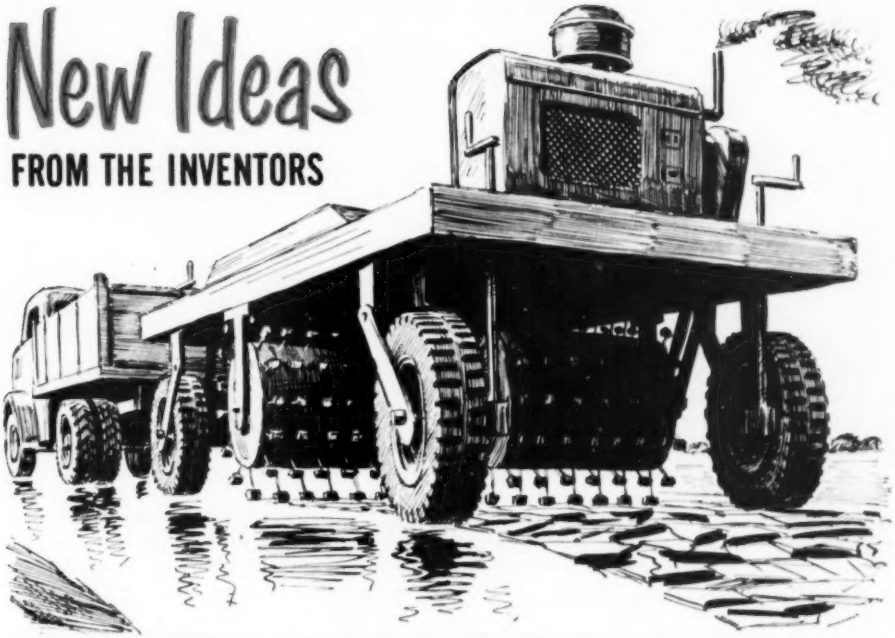
Outside dimensions: height, 62¾" (loaded); over-all length with bumpers and guards, 195 19/32"; width, 69¾"; wheelbase, 116½"; overhang, front 35 3/16", rear 43 15/16"; tread, front 56½", rear 55½".

Inside dimensions: seat-cushion width, front 59½", rear 59"; leg room, front 42½", rear 41½"; headroom, front 38", rear 36"; seat height, front 14¼", rear 14½"; vertical distance, steering wheel to seat cushion, with seat in rear position, 5¾"; front-seat adjustment, horizontal 5½", vertical 15/16".

Tire size: 7.10 by 15.

New Ideas

FROM THE INVENTORS



1 Beaters to Clear Road Ice. Hammer-ended chains attached to revolving drums on this proposed highway-maintenance machine would break up packed ice so it could be swept away by conventional road scrapers. The mechanical chain gang would be towed by a truck or trailer but would carry an independent engine to turn the drums at fixed speed. Drums could be raised or lowered to suit road or ice conditions.

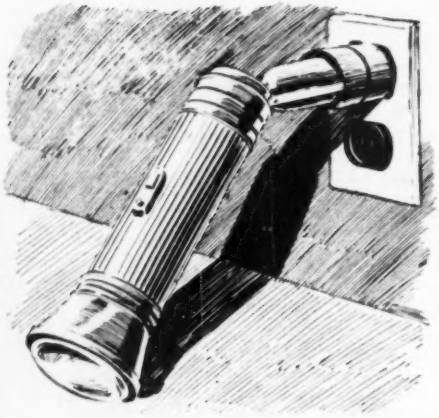
2 Window to Simplify Parking. Power steering now makes parking easier—but you still have to see where you're going. This window, set into the lower part of the door, would help by letting a driver see the far curb. In hot weather, the parking window could be opened to provide extra ventilation.

3 Hunter's Cap to Light Up. A sportsman who wore this blinker light on the top of his head could slink through the brush without danger of becoming a target for careless hunters who aim mainly by ear. The bulb, under a colored dome, is powered by a small battery carried in the wearer's jacket pocket.

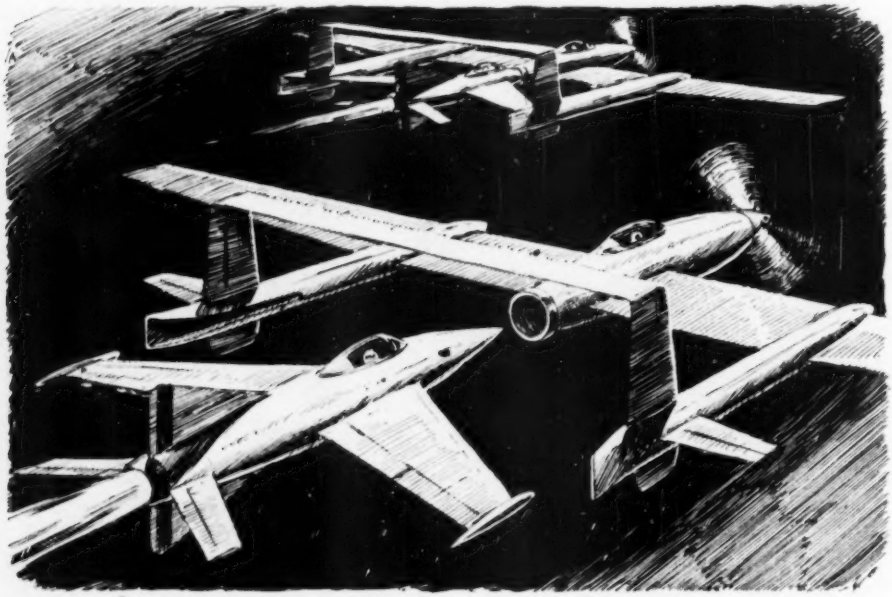
Please turn the page for more new ideas.

MORE New Ideas from the Inventors

4 Bumper Guard to Deflect Car. Sideswipes and even head-on collisions might do less damage if cars were equipped with these deflecting guards. The rigid channel, bent in a broad arc, would be bolted to either or both sides of a bumper. If the car rammed an obstacle, the guard would tend to shove the car sideways.



5 Flashlight to Be Recharged. A new set of flashlight batteries would be as near as a wall plug if your torch were powered by a wet cell and had a built-in charging unit. This standard-size flash would have a rechargeable battery and a rectifier assembly that would slide out of the case and plug into any AC or DC outlet.



6 Fuselage to Form Second Plane. A plane intended for high-speed flight usually has to be carried aloft and launched at suitable speed. According to this French invention, the carrier and carried plane could form a single airborne unit. After the composite plane passed the minimum flying speed of the high-speed subsection, the mother plane would accelerate to pull away from its passenger. The small unit could rejoin the carrier by flying in behind it and locking itself in position.

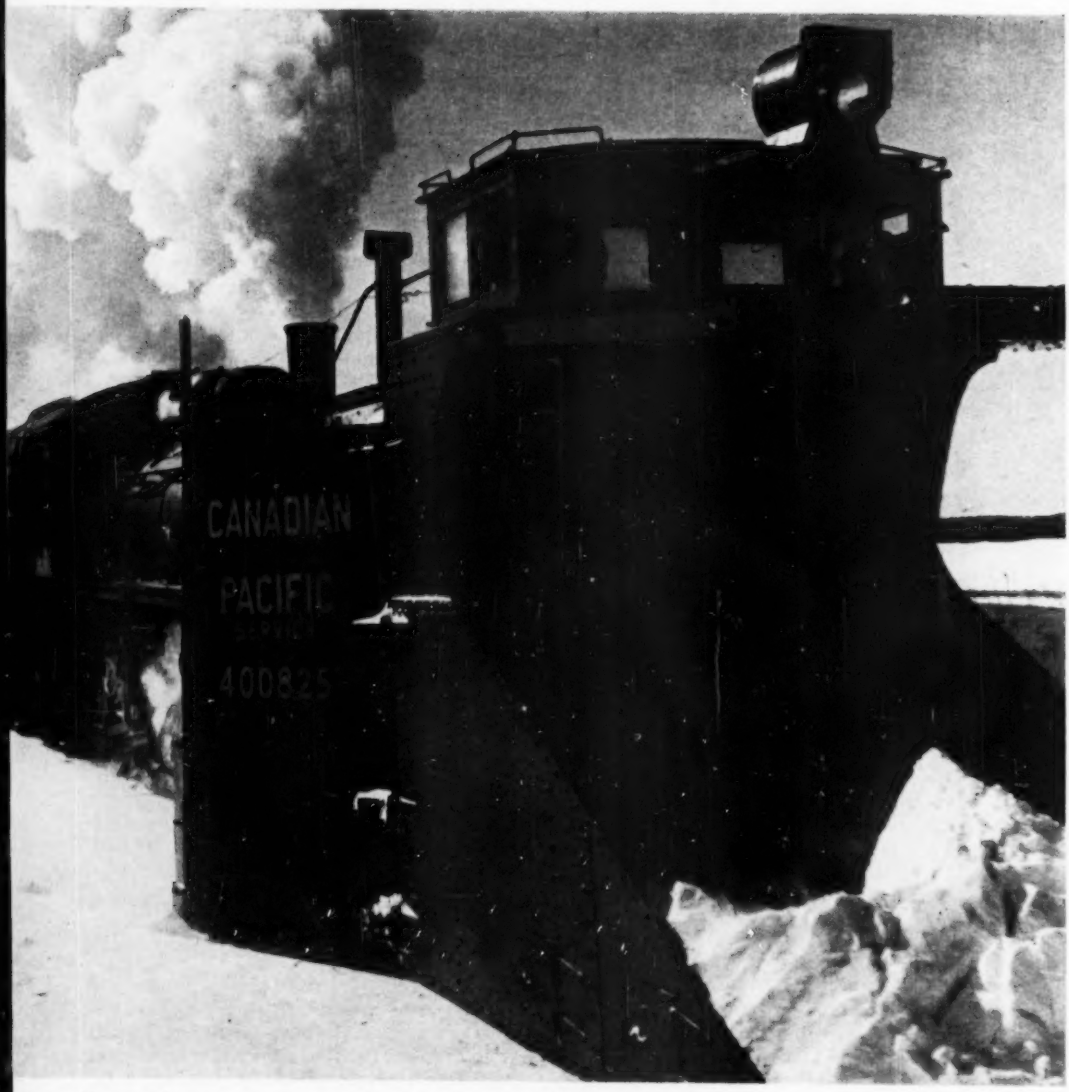
7 Liquid Filter to Cool Pipe. Before smoke from the bowl of this pipe reached the mouthpiece it would pass through a chamber partly filled with liquid. As the smoke whirled over its surface, the liquid would cool the smoke and, says inventor, absorb some of the tars. Valves would prevent liquid from leaking into bowl or stem.

8 Ladder Rail to Steady Climber. The feeling of unsteadiness that makes ladder climbing dangerous for many people might be overcome by a safety rail that would give a climber something to hold onto. This attachment would consist of a pair of mounting brackets and an extension rail that could be pulled out to any desired length.

9 Billy to Fire Tear Gas. A policeman would always have a useful piece of equipment at hand if he carried this double-duty club. The body of the club would contain a hollow tube, the handle a firing mechanism for tear-gas cartridges. Pressing a plunger on the handle would launch the cartridge toward its target. A sliding cap would protect the plunger against accidental discharge.

U. S. patents on these inventions have been granted to: 1. W. A. Lommen, Windom, Minn.; 2. R. Schostal, NYC; 3. N. Prapis, Seattle; 4. M. M. Williams, Miami; 5. R. S. Coolidge, Center Sandwich, N. H., H. W. Keeley, NYC, R. S. Smith, Norwalk, Conn. and T. N. Anderson, Huntington Station, N. Y.; 6. R. A. Rabett, Paris, France; 7. F. E. Null, Dayton, Ohio; 8. J. S. Tepper, Monrovia, Calif.; 9. E. C. Borders Milledgeville, Ga.

Across a vast land laden



"...there to toss the blizzard from his path
Across the prairies of Saskatchewan."

with snow... Canada delivers the Christmas Mail

—E. J. Pratt

By Wesley S. Griswold

GIVEN a frosty dominion 3,800 miles broad and 3,000 miles deep to crisscross on his appointed rounds, the Canadian postman at Christmas faces a task for which he must call upon nearly every type of vehicle devised by man.

This epic mobilization of transport, ranging from the simplest, almost ageless means to the most mechanistically modern, has inspired photographers of Canada's National Film Board, and we have here chosen fitting fragments from the verse of Canadian poets to caption their romantic pictures.

To the laboring postman's aid come planes on pontoons,

"Empty prairie slides away on all sides . . ."
—Anne Marriott

"There is virtue, too, in a grey and dragonish sea." —CHARLES BRUCE

"Cold-blooded things yet not marine,
And not of earth, but half-between . . ." —E. J. PRATT

"Comes like a swallow veering home."

"A common hope dilates each breast,
One spark gleams in each eye . . ." —Leo Kennedy

—Duncan C. Scott

wheels and skis. Trains of railroad cars and trains of sleds, drawn by tractors specially footed to tread snow "high to a horse's belly," help carry the burden of gifts and holiday messages across the white continent from Come By Chance, Newfoundland, to Spuzzum, B. C.

Yuletide mail is borne by ship and ice canoe, by snowmobile and handcart, by dog sled and by a solitary, ship-based helicopter, by pack horse, and by horses hauling buggies or sleighs—"slides," the Newfoundlanders call them.

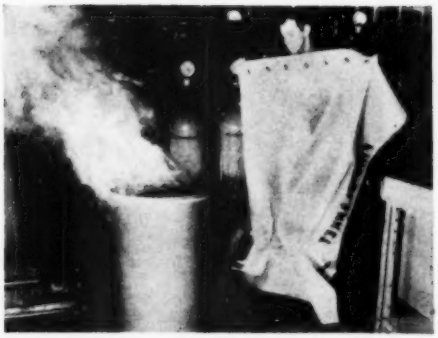
It's a job of heroic proportions, enlisting more than 33,000 extra helpers for the 42,000 Canadians who regularly man the country's efficient postal service. It begins in late June, when the government ship *C. D. Howe* lifts anchor at Montreal and heads for Arctic waters still flecked with ice, carrying in its hold Christmas mail for the Eskimos and the many other Canadians who live and work in the remote Northeast. It picks up momentum just before Thanksgiving, when packages for relatives overseas funnel into eastern and western ports to be hoisted aboard ocean liners. It

"Will they come again, the great spirits,
Bringing us gifts as they promised . . . ?" —Arthur S. Bourinot

reaches its sprawling, bustling climax early in December, when the flood tide of mail and postal clerks laps over into church halls, automobile salesrooms, schools and fraternal clubrooms.

It's an essential job that, as Archibald Lampman, a Canadian poet, has written, goes on "all day without stint and all night long with the sweep of the hissing drift." END

"And our hearts were great with happiness
And brothers we called them . . ." —Arthur S. Bourinot



Blanket Wraps Up Flame

A NEW blanket is made of glass—but it's to put fire under wraps, not you. Its glass fibers are coated with a plastic compound to give added strength, durability and resistance to weather. Standard Safety Equipment Co. of Chicago makes it.

Come on Up, Parking's Fine

THIS giant car lift lets two cars park where one parked before. Called a Sky Park, the machine was perfected by the Simmons Machine Tool Corp., Albany, N. Y. It is designed for use at parking lots or curbs.

Skates Roll or Slide

THE sole plates of this German boy's skates carry axles as well as blades. When there's no ice, he just adds wheels for sidewalk cruising. The "convertibles" were shown at a fair in Nuremberg.

Earphone Silences Television for All but One Listener

JUNIOR'S TV programs get you down? You can read in peace in the same room if he has his own earphone which he wears like a hearing aid. A flick of the dial returns the sound to the regular loudspeaker. Kentrol Corp., Philadelphia, makes it.

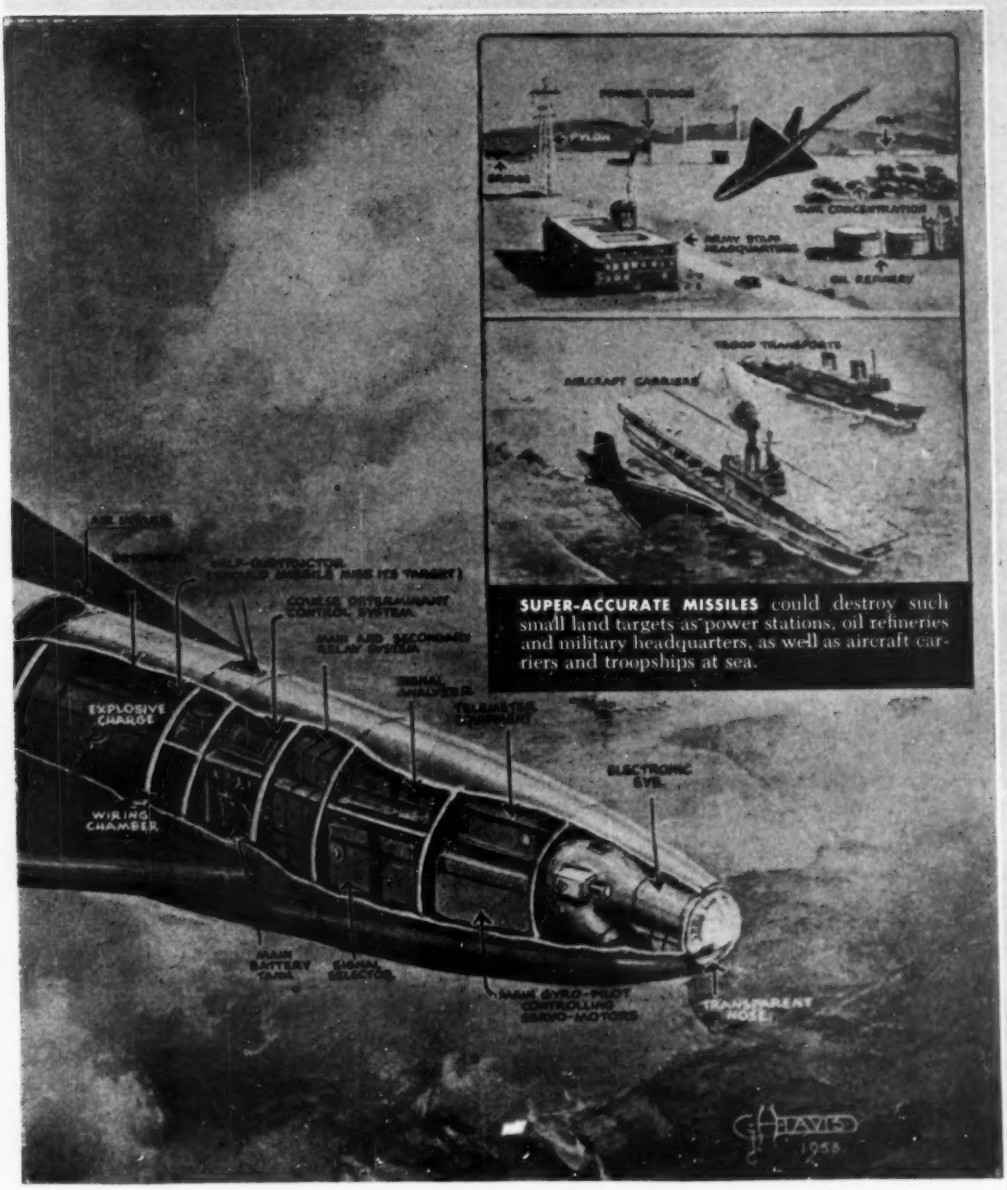
▶▶▶A special cleaner for plastic dishes is now on the market. M-E will safely remove coffee, fruit and other hard-to-budge food stains, says Maid-Easy Cleansing Products Corp., Mount Vernon, N. Y.

CONTROLLER-LAUNCHER could be in airplane, on surface ship or on land hundreds of miles from target area.

Seeing-Eye Jet Proposed as Robot Raider

LONG-RANGE missiles that can "see" and home on their targets are being designed by the British. The illustration above, from the *Illustrated London News,* is a conception by the artist G. H. Davis of how one of the weapons might look.

The nose is a radome that transmits



SUPER-ACCURATE MISSILES could destroy such small land targets as power stations, oil refineries and military headquarters, as well as aircraft carriers and troopships at sea.

what it "sees" to equipment that digests it and puts the missile on course. The only human hand involved in its flight is that of the controller who launches it. He can be hundreds of miles from the target.

The delta-wing missile pictured would be propelled by an expendable jet engine—the same kind powering fighters and bombers. Its speed would be considerably short of 1,000 m.p.h.—far less than that of rocket-powered missiles. In case it got off course, it would be equipped to destroy itself in the air. END

Station Wagon Runs on Three Wheels

IF YOU want a really low-priced car, reasons James V. Martin, inventor of the small three-wheeler shown above, you have to eliminate a lot of the things that make a car expensive to produce, and still not sacrifice large-car roominess and high performance.

Here are some of the parts of a conventional car that are not found in this little vehicle: chassis frame, axles, steel springs, propeller shaft, universal joints, differential gears, shock absorbers.

The Martin Stationette is being engineered for production by the Commonwealth Research Corp., New York City, to sell for around $750. It has 49 inches headroom, the seat is the full width of a normal car and there is a 43-cubic-foot storage space over the rear engine. The car is 114 inches long and has a 52-inch tread. Airplane-type suspension, a rubber shock cord, takes the place of springs on the prototype. An unusual wheel to replace all springing is planned for the production model.

FOUR-CYLINDER, 24-horsepower, water-cooled engine is rear-mounted. A cruising speed of 50-55 miles an hour is claimed.

NEW TYPE OF WHEEL, invented by Martin, has solid-rubber rim and flexible-rubber spokes, is claimed to provide all springing needed.

Games Disclose Secrets of Success

Scientists are determining the best strategy in war and business by watching their students play cards.

By Bruce Bliven

IF YOU were a college student and were told by your instructor to play poker in the classroom, you might think he was out of his head. But he might know exactly what he was doing.

In half a dozen American colleges, hundreds of students have been playing specially modified forms of card games in the interest of scientific knowledge. Such experiments already have had important results and are likely to have more.

These games are played under conditions that would bewilder and annoy the boys in the back room of Joe's Smoke Shop. Special rules are written, and these sometimes are changed without warning. At stated intervals, too, play is halted and observers standing behind the players take elaborate notes.

The mathematical odds against a perfect bridge hand, if the cards have been properly shuffled, are

635,013,559,599 to 1

Consider, for example, the way students of Prof. Lyle Shannon at the University of Washington play the card game called "Monopoly." This is a game in which players are dealt cards representing various quantities of "money," with which they "buy or sell real estate." The object is to obtain ownership of as much "property" as possible. When Monopoly is used for scientific experimentation, the cards are dealt purposely to make some players "rich," some "moderately well-to-do," and others "poor."

Then, while the play is progressing, dice are thrown, and

Strategy Helps in Finger Game

according to how they lie, one or another of the players is notified that he has "inherited a fortune," or "suffered a disastrous fire" or "experienced a lingering illness." His cards are then changed to accord with these strokes of good or bad luck.

In this game, two players simultaneously show one, two or three fingers; and one of them tries to call out the total number of fingers shown by both. Thus it involves both luck and skill in outguessing the other fellow. On the basis of complicated mathematics, Dr. John Von Neumann has worked out the best strategy: Keep guessing that the combined number of fingers shown is four; in every 12 games, show one finger five times, two fingers four times, three fingers three times —but not in any regular order. You should at least break even, probably win. What happens if you and your opponent both follow this strategy, Von Neumann doesn't say!

Hundreds of games, played this way over a period of years, have been analyzed to see what lessons in human behavior can be drawn from them. While these conclusions are thus far only tentative, some have turned up with such regularity that they can be put forward with confidence. A few are:

In the playing of these games, the rich tend to get richer, and the poor get poorer. The resources of the well-to-do give them an advantage *which is not overcome by superior skill* on the part of the poor.

The poor are inclined to gamble recklessly and extravagantly, and for this reason to lose everything they have. The well-to-do, the only ones who can really afford to gamble, take smaller chances. But even if they lose, it isn't fatal.

While training, experience and education are useful to everybody, they are more useful to the rich than the poor.

The results of these experiments interlock with those achieved in an exciting new aspect of science called "the theory of games." The known principles of probability have been applied to games which employ a combination of luck and skill, in ways that involve tremendously complicated mathematical formulas. And human behavior in games of the type mentioned, which involve some skill and some luck, has been found to be identical with what people do in competitive business and with strategy and tactics in war.

Flouting Math-Proved Principles Can Be Ruinous

In all these activities, there are good and bad broad, general courses of conduct, which can be mathematically proved to be such.

Some of these principles, of course, have in the past been practiced intuitively by shrewd individuals, whether they were playing cards, running a business or fighting a war. Now for the first time their shrewdness can be underpinned with scientific facts. Learning these principles might not make you a good poker player or a successful general, but flouting them is fairly sure to be ruinous.

Examples of the contests that reveal these principles are nearly all card games; excluded are games of pure chance like throwing dice or betting on a roulette wheel. Excluded also are games like chess, checkers and ticktacktoe where no element of luck enters in, and each player knows at every moment the situation confronted by himself and his opponent.

Prof. R. Creighton Buck of the University of Wisconsin, one of the leaders in this new activity, emphasizes the underlying principle when he defines a game as "any situation involving groups with conflicting interests, in which the outcome is only partly controlled by each party." And Dr. Oskar Morgenstern of Princeton, another leading authority, highlights the point by observing that we habitually apply the language of games to such things as business and politics, speaking of "a political deal," or of "playing the stock market."

Some Formulas Can Be Applied to All Types of Chance

"When they are examined by the methods of modern mathematics," says Dr. Morgenstern, "it becomes evident that many of the forms of economic and social behavior are strictly identical with—not merely analogous to—games of strategy."

The most remarkable part of the matter is the discovery that mathematical formulas often can be written which cover the best procedure in games, business and war alike. The United States Army, Navy and Air Force are today spending millions of dollars annually studying the relationship of games to war, and are deducing principles which will be of great importance in the future.

Several centuries ago, it was learned that there are mathematical laws of probability which apply to matters where there is a strong element of pure chance. The first scientist to go deeply into the question was the famous German philosopher and mathematician, Gottfried Wilhelm Leibnitz (1646-1716). Coming down to modern times, the person who best deserves to be called the father of the new science is Dr. John Von Neumann of the Institute for Advanced Study, the internationally famous intellectual center at Princeton, N. J.

Dr. Von Neumann, now 50 years old, was born in Budapest, Hungary, and studied mathematics at various European universities. When it became clear that Hitler was going to dominate Central Europe, he came to America and became a professor at Princeton University. Experts regard him as one of the greatest mathematical brains in the world. For many years he has performed valuable services in help-

Strategy Doesn't Help in Roulette

Here the result depends on pure chance, and mathematicians say no "system" is safe. One of the commonest systems is to select one color—red or black—and keep betting on it. If you lose, double your bet next time and so on. Thus one winning bet will slightly more than compensate for all previous losses. But this system assumes that red is sure to turn up after black has won a few times in succession, and vice versa. Actually, after black has won 10 times in a row, the chance that it will come up again is still exactly 50-50. If you started by betting $2 on red, on the eleventh try, after losing $2,046, you are simply betting $2,048 on an even chance.

ing the American armed forces in the development of new weapons.

A few years ago, in collaboration with Dr. Morgenstern, he wrote a book, *The Theory of Games and Economic Behavior.* Although every page is sprinkled with difficult mathematical formulas, so that the volume is hopelessly beyond the understanding of the average layman, it has gone through edition after edition as mathematicians, sociologists and military strategists have pondered its revolutionary proof that in games and other activities which involve some skill and some pure luck or chance, *there is always one best strategy.*

Business competition is like a card game. You know the strength and weakness of your own position but you can only guess at those of the other fellow.

This is also true of war. The commander of an army knows what forces are at his disposal, and the general character of the terrain over which he must fight. Usually he knows something about the size of the enemy army, but not very accurately, and he can only guess at what that enemy is about to do. The combination of his skill in maneuvering his own troops, his accuracy in guessing what the enemy will do, and of course the relative size and strength of the forces on each side, will determine the outcome.

Using modern electronic computing machines, thousands of hours have been spent in doing the complicated mathematical calculations that are needed to discover the best strategy in various games which use both skill and luck. As an example of the complications that exist, Dr. Von Neumann worked out the simplest possible two-handed game of poker. In this there are only two players, only three cards in the deck, and only three bids, two of them by the dealer. Even so, there are 1,728 possible combinations of play. To figure out approximately the best strategy for each player would require two billion multiplications and additions.

It Pays to Know the Laws

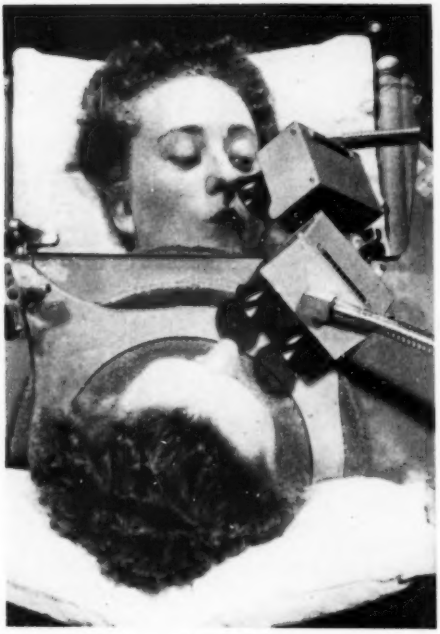
Thousands of people lose large sums of money every year in gambling because of a misunderstanding of the laws of probability. They try to play a "system" in such games as tossing a coin or in roulette. Despite all the stories you

[*Continued on page 246*]

New Games Test Luck at Piloting Spaceships, Assembling Cars

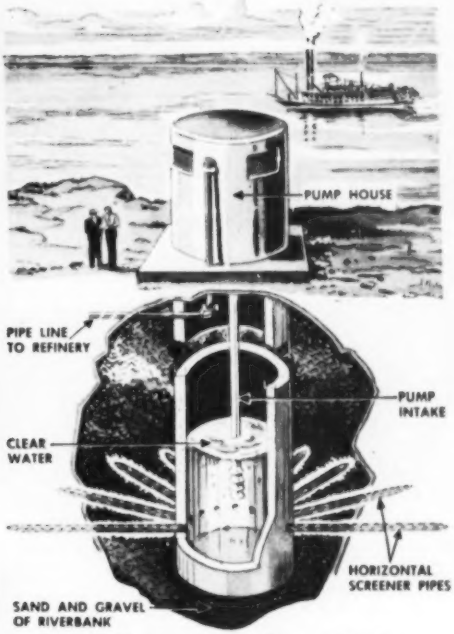
BLAST OFF is based on the current interest in space travel. Players pilot tiny rocket ships through the heavens. They land on moving planets—Jupiter, Venus, Mercury, Mars, Saturn—pick up cargoes of rare minerals and try to be first to return to earth. Flights are determined by spinning a pointer, and victory depends mostly on luck.

ASSEMBLY LINE gives each player an automobile factory to manage. According to his luck in throwing a die and spinning a pointer, he puts together plastic auto parts —motors, bodies, wheels, steering posts— and rolls completed cars off the assembly line. Highest producer wins. Both games are made by Selchow & Righter, New York.



Breath Operates TV Set

A CONTROL switch so delicate that a breath of air can change it permits handicapped persons to operate a remote-control TV set. Blowing lightly through one of the mouthpieces shown above switches the loudspeaker on or off. Blowing through the other shifts the set from one channel to the next. The secret is a delicately balanced vane inside each mouthpiece. Moved by a breath, the vanes actuate cam-operated switches controlling relays. These in turn operate the control mechanisms. The device, shown being used by a polio patient in her home, was developed by the Lion Manufacturing Co. of Chicago.

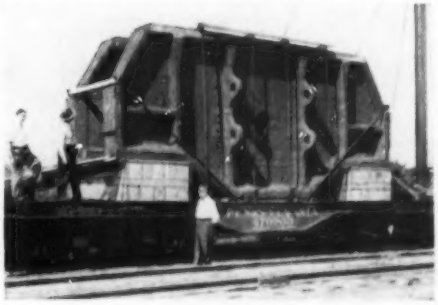


Well Filters Out River Mud

PROBLEM: how to tap the Mississippi without getting Mississippi mud. Engineers who needed new water sources for a refinery solved it by the horizontal well system shown in the drawing. The big 13-foot central shaft was sunk 112 feet deep near the bank of the river at Hartford, Ill. Then smaller perforated pipes, 104 to 176 feet long, were pushed out horizontally from the shaft into sand and gravel beds that underlie the Mississippi. Filtered through these beds, the water is perfectly clear by the time it reaches the collecting pipes. The well will supply Shell Oil up to 10,000,000 gallons of water a day.

207-Ton Casting for 50,000-Ton Press Rides 16-Wheel Flatcar

RIDING the rails at right is the heaviest single object ever imported through the port of New York and the biggest casting ever made in the British Isles. It is part of a 50,000-ton-capacity hydraulic press that will forge air frames for the Air Force.



▶▶▶Another smidgen of matter in the atom has been made in the Brookhaven cosmotron. Called the neutral V particle because of the shape of its vapor trail, it's similar to particles found in cosmic rays.

USING SKIS OR WHEELS of their dual-purpose landing gear, as the snow condition permitted, Air Force C-47s airlifted Seabees to the site, tested the airstrip as it took shape.

Airstrip Made of Snow Helps Guard Far North

A HARROWING JOB was the first step in building the snow airstrip. Tractors with broad, wood-slatted treads hauled special disk harrows on runners, like this one, across the trackless icecap. Chewing up the virgin snow made it denser and evener in texture. It was then compacted by huge rollers, shown on opposite page.

Often a train of two tractors, a pulverizer and a roller combined the operations.

ON AN icecap near the North Pole, in Danish territory, the U. S. Navy and Air Force this year built a firm airstrip entirely of snow. In fact, the mile-long runway, 150 feet wide, was simply a compacted layer on top of several hundred feet of snow.

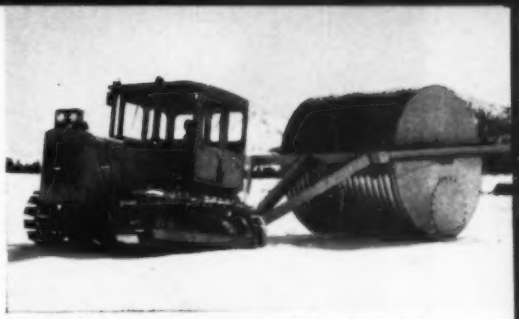
It was the first snow runway to be built so far north. The special equipment used, shown here at the job, was disassembled and airlifted to the location, along with the Seabees who put it together and set it to work.

Building the airstrip successfully out of material so abundantly at hand was a heartening demonstration to the men who are constructing a network of powerful bases in Arctic regions to protect the air approaches to northeastern Canada and the U. S.

Snow Is Pulverized, Then Packed Down

The technique was simple. It consisted of pulverizing virgin snow and then packing it hard with huge rollers. The surface became harder as it settled. Scraping and rerolling kept it in usable shape.

The equipment had been thoroughly pretested at Camp Hale, Colo.; in the Sierras; in Alaska; and at Kapuskasing, Ont.



TEN-FOOT, 11-TON ROLLERS of steel packed the pulverized snow. Most had a corrugated surface (above). Rear blades, seen on uncorrugated roller below, prevented caking.

Planes on skis made the first landings and take-offs, but by early June the airstrip was strong enough to be safe for wheeled aircraft.

TESTING SNOW DENSITY before the pulverizers go to work, this man is weighing a measured depth of snow. He got it with sampler (near right hand), melted it for water equivalent.

C-47'S WHEEL TRACK has gouged corrugated snow surface that easily supports two men who are measuring the track's depth. They will figure what weight the surface can bear.

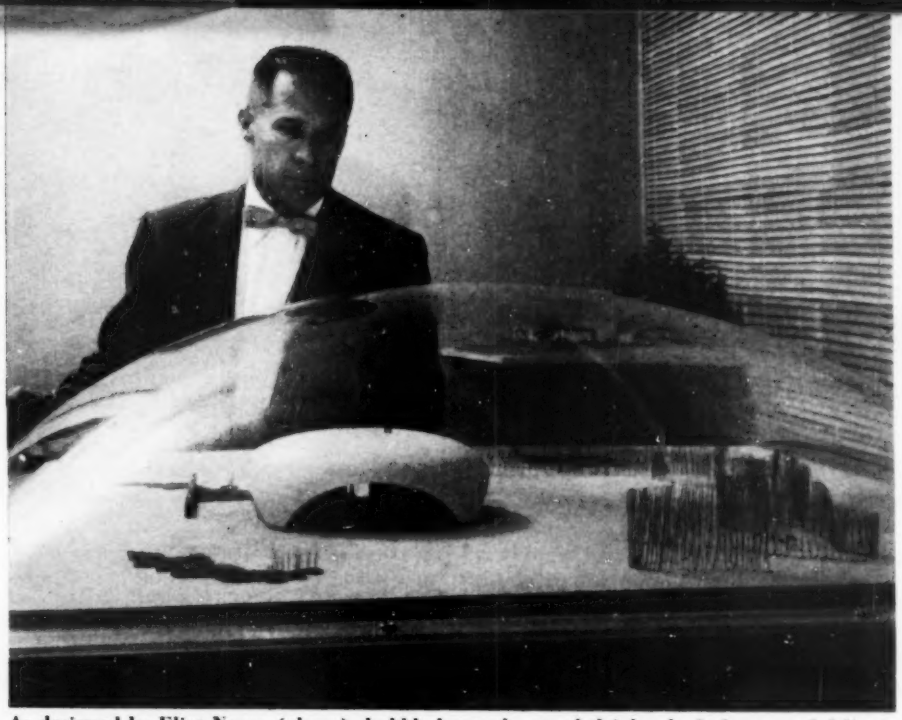
Copter Plays Cops and Robbers

DOWN the highways and byways of rural England, a speeding car twisted and turned. But the driver never shook off the ominous roar that pursued him—the roar of a helicopter that clung grimly to his tail. Suddenly police cars loomed ahead at a crossroads, blocking him off. The fugitive car ground to a halt, trapped—just 14 minutes after the copter had sighted it from the air.

British police officials were playing cops and robbers to show student bobbies how the helicopter could be used to capture escaping criminals. The "wanted" car with the fleeing hold-up men was given a head start, then a description was radioed to the pilot of a Bristol Sycamore copter. The pilot had no idea where the wanted car would go, but he quickly spotted it from the air. As he followed it at 150-foot altitude, he kept in constant radio touch with ground police in squad cars who headed off the fugitives.

HEADQUARTERS gets pilot's reports on fleeing car, relays them to squad cars in area.

PILOT'S-EYE VIEW as squad cars bottle up wanted car, coppers move in to nab "thieves."



As designed by Eliot Noyes (above), bubble house has traded igloo look for graceful lines.

Life in a Bubble Can Be Beautiful

A modern architect proposes a new kind of living space in easy-to-build homes of gracefully arched design.

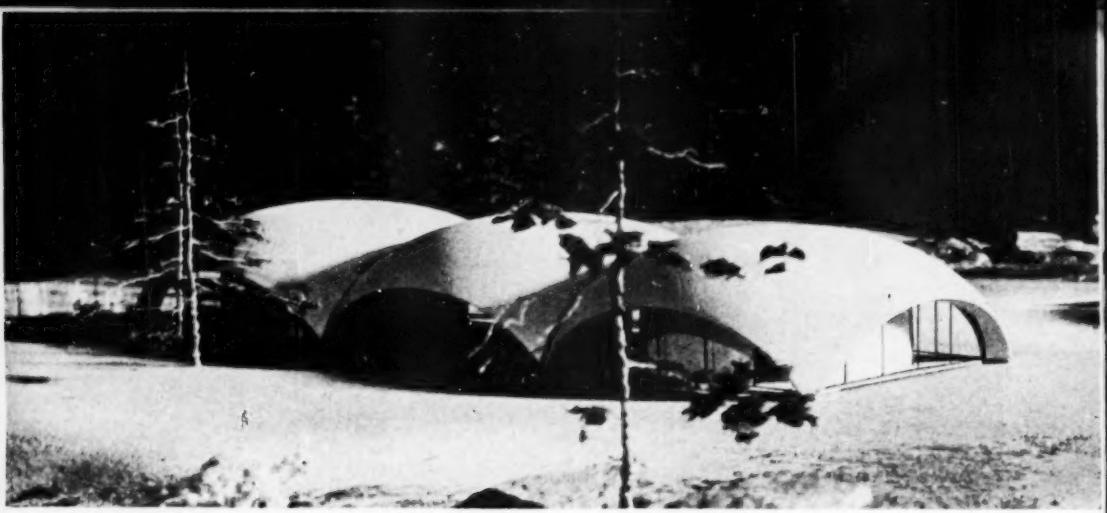
WHAT will it be like to dwell in a bubble house—a new design for living?

"Wonderful," says 42-year-old Eliot Noyes, Harvard-trained modern architect and industrial designer.

"To live in a bubble house," he expands enthusiastically, "is going to be a wholly new experience. Because the system of building them is economical, we shall be able to afford more space than in conventional houses. But it will also be a new kind of space and will feel very different from any houses ever built before. We are all used to living in box-shaped rooms with flat ceilings. Now we can live under great arching surfaces which curve overhead. And they will also be beautiful shapes outside."

Economy of the bubble, or Airform, house is in the simplicity of its basic construction. Concrete is pressure-sprayed over an inflated neoprene-nylon bag. When the concrete has set, the balloon-like bag is deflated—and there is the shell of the house. It takes 24 hours to do the job.

The shape of the bag thus determines



the shape of the house. It can be ugly or beautiful. It is all in the design of the bag. And that is where architect Noyes of New Canaan, Conn., comes into the picture, with the promise of 600 square feet of living space for around $6,000. Two experimental bubble houses have just been completed at Hobe Sound, Fla. The models on these pages are larger, more elaborate—and more expensive.

The concrete-sprayed-over-a-balloon method of construction itself is not new. It was invented by a California architect, Wallace Neff, and is now controlled by the Airform International Construction Corp. of New York City. Aside from a few homes in California and the Southwest, and a group of experimental bubble houses in the East, most Airform construction as residences has been for mass

OPEN PLANNING like this is possible because no supporting beams or partitions are needed. Where privacy is essential, partitions could be extended up to a false ceiling.

Triple Bubble Provides Separate Children's Area

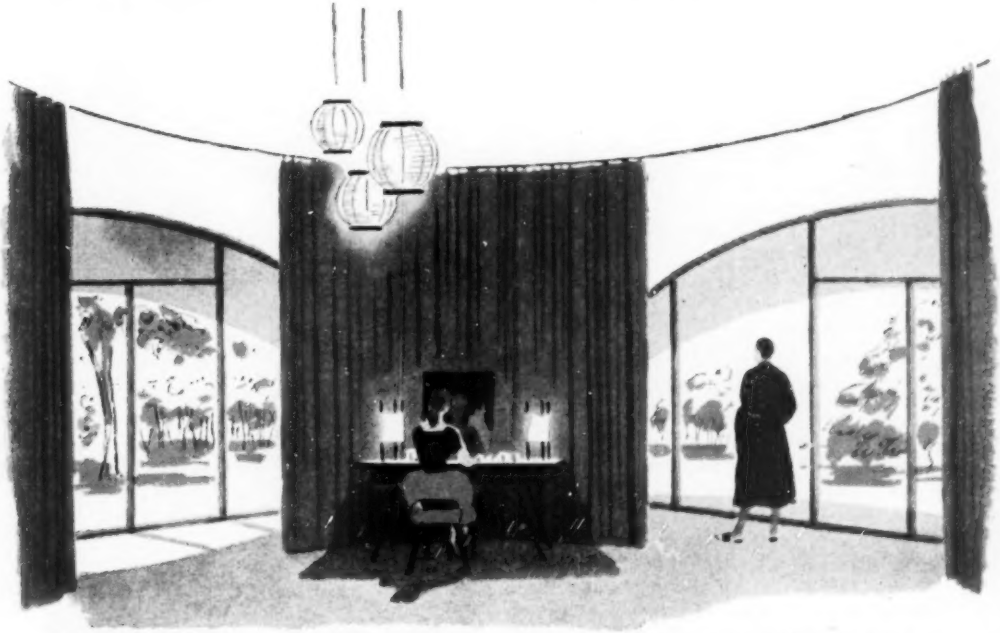
LUXURY VERSION at left, with 3,000 square feet in triple bubble, has separate garage with plenty of room for two cars and space for tools and garden implements. One of side bubbles would have master bedrooms (right below) and guest room; other end unit would be children's play and sleeping area. Bubble in the middle would be a completely open, domed space to meet the living needs of the entire family (left below). Model was made to show Airform shapes and a possible arrangement. Doors and windows would be integral parts of bubbles.

housing in Venezuela, South Africa and Pakistan.

These served admirably in taking natives out of squalid huts into comparative luxury. But they were an ugly, igloo-like shape—with little thought to good design. One example was doors and windows, which were stuck on as appendages, having no relationship to the lines of the bubble form.

Recently Eliot Noyes saw the possibilities of this type of housing and, with the cooperation of Airform, has helped redesign the bag so that it will become a mold for bubbles beautiful.

With the bag supplied on a rental basis by Airform, any local contractor with concrete-spraying equipment can put up Noyes-designed bubble houses.—*Herbert O. Johansen.*



CURTAINS and low, room-dividing partitions would be used to a great extent for privacy. People with hermit complexes, however, shouldn't live in bubble houses.

Coming Up... Mechanical Groceries

You Pays Your Money . . .

CUSTOMERS will carry around a combination key and adding machine to unlock shelves and total their purchases in an automatic grocery store now being planned. Raking the key over a toothed latch would free a can or carton and simultaneously spin gears to add the cost of the item to the bill. Gravity chutes will keep the shelves full. Clarence Saunders, veteran chain-store promoter, invented the "foodelectric."

. . . And You Takes Your Choice

THE English vending machine below gives a choice of 25 different grocery items. As each item drops down, its cost is deducted from the total amount of money you've put in and a cash balance appears on a lighted panel. You can keep on buying until the money fed into the machine is used up.

Brushes Bend to Coat TV Tubes

IF YOU'VE ever tried to build a ship in a bottle, you'll understand the problems of workers who paint the inside of TV tubes. In a 21-inch tube there are nearly 500 square inches to be covered with black graphite—an electrical conductor. As shown at right, the job is done at GE in less than two minutes with double-jointed paintbrushes.

Mechanical Woodpecker Keeps Creator in the Chips

A FLOCK OF YOGIS (left), spectacularly successful invention of Fritz Wigal of Jackson, Tenn., heads straight up a windowpane on suction-cup feet (shown in the inset).

A FELLOW by the name of V. F. Wigal, whom his friends call Fritz, will rake in around $500,000 by next June because he invented a plastic woodpecker that can climb up and down walls and even walk across ceilings. The bird's name, odd but simple, is Yogi.

You've probably run across Yogi already, for 100,000 gaudy copies of him are being turned out every day and 4,000,000 have been ordered since last June, when he first went on sale. His

hollow pecking, as he trudges up and down display windows, can be heard throughout the land—and in several foreign countries as well.

Yogi gets around, mostly vertically, on five vacuum cups attached to a ratchet powered by a key-wound spring.

No Good for Industry

Wigal was bitten by the germ of the idea for Yogi five years ago when he started idly fingering a vacuum cup that he'd found. Why not use a series of these things, taking hold and letting go in rotation, to make something move?

It took Wigal five years of strenuous part-time elaboration of this thought before he produced Yogi.

He tried first to apply the vacuum cup idea to some industrial process. That didn't pan out.

At last he decided to use the principle in a toy. He had already invented two.

What he needed now was an unusual toy. He finally settled on a woodpecker. People much more often see a woodpecker climb than fly, and the vacuum cups ought to be just the thing to turn the trick, he figured.

FRITZ WIGAL, 37, smiles contentedly at the plastic bird that is bringing him a fortune.

The first model was cumbersome and heavy. In it he had fitted vacuum cups to the prongs of a sprocket that was turned by gears powered by a clock spring. One trouble was that the cups gripped surfaces with such enthusiasm that it took an impractical amount of force to pry them loose.

So Wigal developed a new type of vacuum cup, one that would release itself easily and quickly. This enabled him to simplify his toy and reduce its weight from three-quarters of a pound to a little more than an ounce. Then he fitted five vacuum cups on a ratchet, which he "floated" on a horizontal axis inside the bird.

The spring, made of thin wire, surrounds the bird's axis and is wound by a key fixed to one end of the axis. As the spring unwinds the axis turns slowly, loosening the grip of one vacuum cup while forcing the next one against the surface Yogi is climbing. This goes on until the spring is wholly unwound. Then be ready to catch Yogi as he falls.

Wigal now works with Tigrett Enterprises in Jackson, Tenn., manufacturers of Yogi. He is a good-looking bachelor of 37, who at 14, in his native West Virginia, "invented" a hand-operated mechanism for changing the pitch of an airplane's propeller in flight. A helpful patent attorney soon discovered for the bright lad that the same idea had been applied to the blades of steamboat propellers on the Ohio River 40 years earlier.

This setback gave Wigal a high regard for patent attorneys. To all would-be inventors, he says, "Get the best one you can to search the field for you before you waste time and effort on an idea that somebody else may already have patented."

Rules for Inventors

Speaking with the authority of an inventor who has already struck it rich, Wigal also has these sound suggestions for the man who feels inventive:

1. Have a steady job while you invent. You can get mighty hungry waiting for an idea to pay off.

2. Don't discourage easily. Be satisfied if only a few of your ideas succeed.

3. Always ask yourself: "Is this idea something people need? Is it new and novel enough to appeal to them? If it's perfected, will it lure people into buying it?

Maybe you can make half a million, too.—*Robert P. Mahon Jr.*

Shipwrecked Sailors Get Waterproof, Bump-proof Radio Station

A WHOLE radio station for shipwrecked seamen has been packed into less than two cubic feet. Drop it 20 feet into the sea and it just floats around undamaged, ready to be fished out and put to work. The new lifeboat set weighs less than 60 pounds, yet includes a two-frequency transmitter and receiver, an automatic keyer, a hand generator for power supply, an antenna and a collapsible 15-foot antenna mast. The transmitter can be set to send automatic SOS signals as long as the generator is cranked, alternating between the two frequencies. Radiomarine makes it.

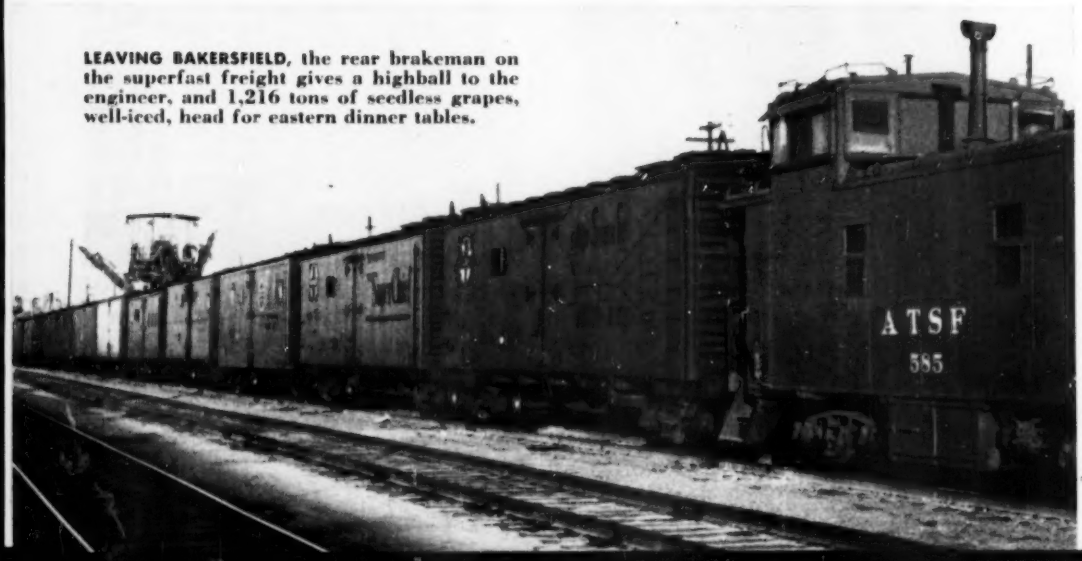
Fourteen-Story Building Quietly Bolted, Not Riveted

THERE was no rat-a-tat-tat of riveters' guns to disturb patients of the hospital next door when the new Medical Sciences Building (right above) went up in San Francisco. The 2,000-ton framework was put together with more than 70,000 bolts, tightened with power-driven wrenches (left above). Bethlehem Steel, which made the bolts, says the process is as fast as riveting, makes stronger joints.

APPROACHING CHICAGO, white express flags fluttering, Santa Fe's 62 ends its 62-hour dash from Bakersfield, Calif., with 24 refrigerator cars of fruit. *Photo from Trains & Travel*

Grapes are whisked from California to Chicago on

Fastest Freight



LEAVING BAKERSFIELD, the rear brakeman on the superfast freight gives a highball to the engineer, and 1,216 tons of seedless grapes, well-iced, head for eastern dinner tables.

Train

Riding Santa Fe's No. 62 is as thrilling as racing a sports car 2,195 miles.

By Kenneth Wylie

IT IS nearing eight o'clock on a Thursday night in Bakersfield, Calif. At exactly eight, Santa Fe's No. 62, the world's fastest freight train, will pull out for Chicago with a consignment of two dozen refrigerator cars—"reefers," railroaders call them.

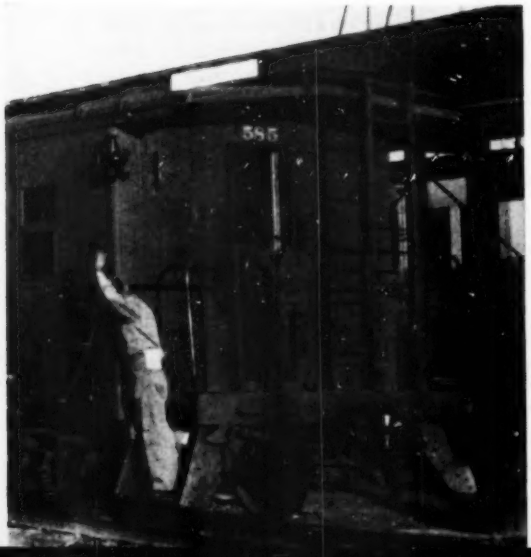
Only a relatively few hours before, vineyard men checked their crop of seedless grapes and found its average sugar content at just the right level for shipping.

The call went out for pickers, and soon stacks of thin crates started mounting in loading sheds beside the spurs and sidings where 62 is loaded.

Now stevedores are storing each reefer with 34,000 pounds of cargo.

Departure time ticks nearer, and the train crew is eager to take off. Now comes the icing show, staged by the railroad's Refrigerator Department—the R-D boys.

The R-D crew at Bakersfield takes over at 7:20 with an electronically controlled ice machine. This machine feeds on 300-pound blocks of ice, takes orders by radio and runs alongside the trains it services on its own set of 12-foot rails atop an ice dock.



Reefer Loaded in 90 Seconds

The bunkers of each reefer are loaded with around six tons of ice and a hefty sprinkling of salt. Total time for the whole train of 24 cars: 36 minutes, or one and a half minutes per car.

The icing is now finished, the wheel check is done, the conductor's flimsies are stuffed in his pocket and the engineer is in his cab.

The clearance comes.

"You've got a trainload, 62. Take off,"

FRESH FROM THE VINES, grapes are trucked aboard a "reefer," 34,000 pounds to the car. The cars get two icings on way to Chicago, where most are switched to eastern roads.

the intercom radio in our cab scratches, giving the engineer his control-tower okay.

The block signal ahead is green. The conductor gives his highball in the dim light, and No. 62 roars, spewing blue fumes as she heads into the darkness.

In no time we hit 60, running for the foothills. Cuts, trestles flash by. Woods and night sky slant up and away as we bank around curves.

"Watch us walk through the mountains," the engineer calls over the scream of his diesels. The fireman pushes open the engine-room door on his side of the cab and goes back to make a check.

We really do walk through those bare California mountains. The four 200-class Electro Motives whine as the grade begins to lift, but the only noticeable slowdown is for the twisting curves, some of them cutting far back in horseshoes and loops. Behind us the string of reefers bucks and leans.

Two-thirds of a continent away lies Chicago. Fifteen train crews besides this one will work 62 before she slides into the Windy City, Sunday noon. That's nearly twice as fast time for the run as the standard freight makes. Only a few streamlined passenger trains better it. Plenty of passenger runs are slower.

We're on a premium train, all right. It came into being because million-dollar California fruit growers were willing to pay special rates to get their fruit to the country's biggest markets as fast as possible. To cash in on the highest market prices for their goods, they pay $1,169 for each carload.

Big, gruff Jim Mahoney, Santa Fe's superintendent of transportation, was largely instrumental in creating a special freight train to meet their needs.

The secret of No. 62's speed is not alone its rate of travel on open track. Santa Fe's high limit for freights is 60 miles an hour, and not even 62 can exceed this. Freight rolling stock won't take the pounding of higher speeds.

What makes 62 so extra-frisky is its unusually small number of cars (15 to 29) and preferential handling all along the line as an "express special." That means faster checking, faster switching, faster servicing.

We find that out after we have shot down from the Sierras, our wheels pounding a brisk staccato on the long slope to the Mojave. The desert is wide and cool, with nothing but clear semaphores going by.

New Hands and a Fresh Caboose

At Barstow, 141 miles out of Bakersfield, we come to the end of Santa Fe's first division going east, and 62 quickly changes hands. Even a new caboose, fitted out with its own bedding, towels, books, coffee and lunch materials, is wheeled in for the new brakemen and conductor.

This happens at every division point—about 137 miles apart—and as 62 rolls into each yard, wheel crews do a special job and do it in a hurry.

"Rigid inspection," read the orders wired along our route to each yardmaster, but in the 10 or 15 minutes we pause at these points, all the crew can be expected to do is make a fast survey for hotboxes. Dragging brakes and hotboxes are a constant threat on a sustained high-speed trip. But the road puts its best equipment on this train, and it's expected to hold up. The really stiff check will come in Kansas City.

At Cadiz, Calif., the four diesel units start to scream again as we go up, out of the arid lands, twisting high into the ridge that stands as a barrier between desert and Colorado valley.

At a quarter to midnight on the second day of our journey, flood lamps in the Belen, N. M., yards light the truss work of another great icer. The crews clamber over our reefers, spending only half a minute on each one to fill its bunkers with 2,400 pounds of ice.

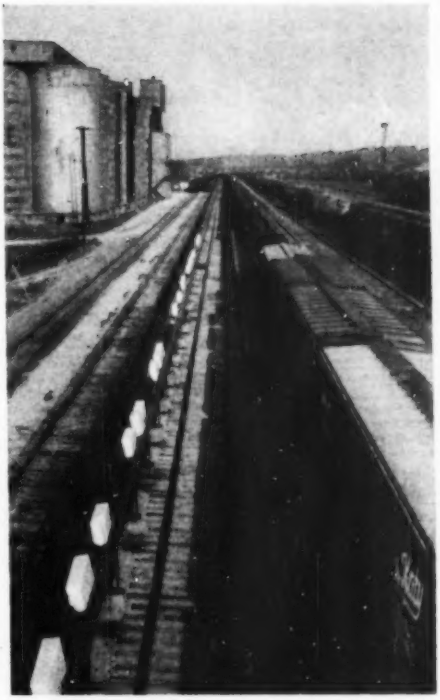
Advance Word Sent to Yards

Nearly 900 miles to the northwest, at the Santa Fe yard in Argentine, Kan.—the world's largest rail yard owned by a single road—the first steps have already been taken for 62's reception.

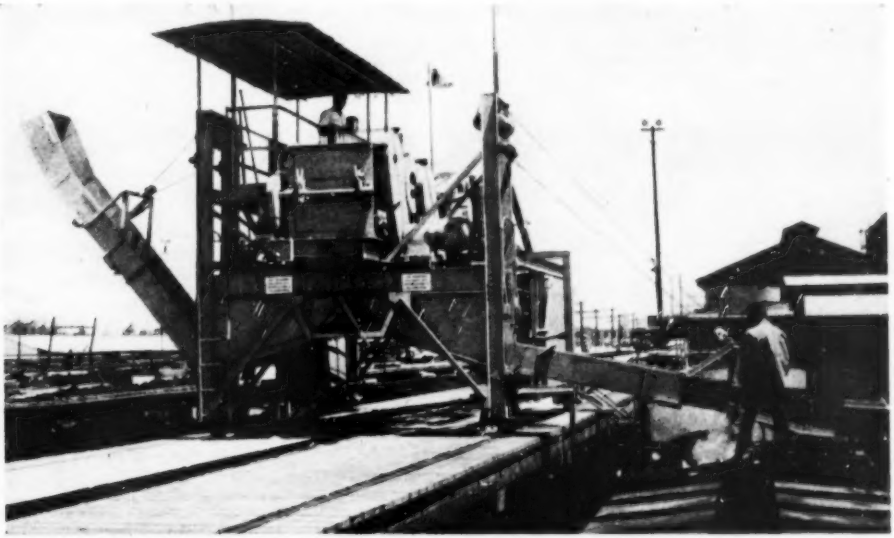
Before we left Bakersfield, word had been flashed to every division on the Coast, Western and Eastern lines of the road that we were coming through.

At 20 minutes after 10 on Saturday night, the big yellow circle of 62's headlight looms larger and larger beside the Argentine ice dock. We are exactly two hours ahead of schedule.

[*Continued on page 242*]



AT THE YELL "ICE," in the vast Santa Fe yards at Argentine, Kan., 300-pound chunks come rolling out on a conveyor from the Railway Ice Company's plant to the railroad's icer.



INTO THE ICER'S MAW go the chunks, which are then chewed up and spit down the electronically controlled machine's huge, armlike chutes, filling a reefer's bunkers in 90 sec.

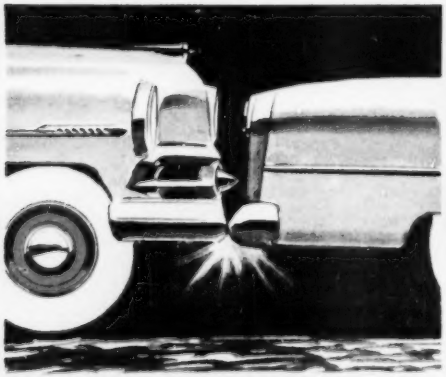
I'd Like to see them make...

Everyone has his own pet idea of some gadget he would like to see in general use. What is YOURS? *Popular Science Monthly* will pay $5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.

ICE-CREAM SCOOPS electrically heated so a housewife without the muscles of a lady wrestler could dig the stuff out of a home freezer.—*Jos. Benzing, Forest Hills, N. Y.*

A HEARING-AID CONVERTER that would let the wearer plug in on house current while listening to TV, to save batteries.—*E. R. Woolner, New Bedford, Mass.*

MOTORCYCLES with hand warmers built into handle-bar grips for winter riding. Current could be supplied by the cycle's regular battery.—*Arthur Hart, Hampden, Maine.*



FRONT SHOCK ABSORBERS interconnected with hydraulic brake lines to keep front of car from diving on hard stops and prevent locked bumpers.—*M. H. Muecke, Pasadena, Tex.*

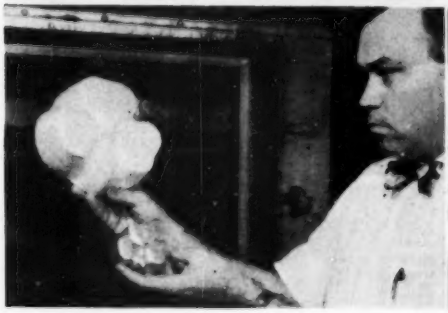
OVERSHOES with nonskid soles that wouldn't wear off. Mixing an abrasive in with the rubber for better traction might increase wear, too.—*Frank Eagan, Blasdell, N. Y.*

"Rocket Water" Yields New Wonder Products

ANTI-TB DRUG, put up in vials by Pfizer, is a life-saving derivative of hydrazine.

TO SAVE MOWING, hydrazine chemical, MH, is sprayed on grass along a highway.

MAKING PLASTIC EXPAND is feat of hydrazine. Here are product and its mold.



ONION SPROUTS can be curbed or wholly stopped with hydrazine preparation.

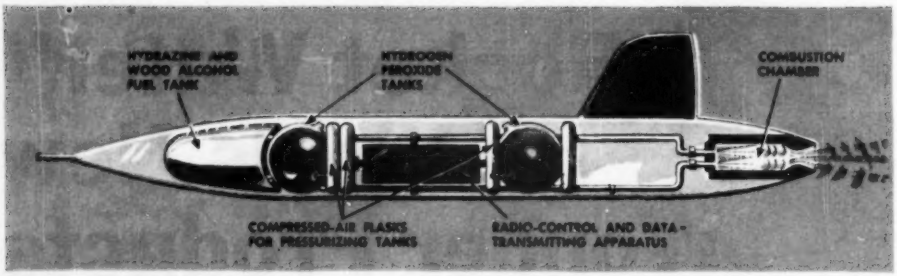
The chemist's wand works magic with hydrazine, war-born fuel, as big-scale production begins.

By Herbert Yahraes

IT LOOKS like the water from your faucet. It boils and freezes at just about the same temperatures as water. But this strange liquid, called "rocket water" by laymen and hydrazine by chemists, will take fire and burn with a blue flame. It is just going into quantity production in the U. S.

Some consider hydrazine one of the best bets for fueling rocket-powered warplanes and guided missiles. It may be the stuff that will push the first spaceship free of the earth.

And with its aid, the chemists have



TYPICAL hydrazine-fueled guided missile is illustrated by simplified sectional view of a research type. Steel combustion chamber has ⅜-inch-thick lining of heat-resisting carbon.

already taken off on adventures into new worlds. For hydrazine serves as the starting point for making a myriad of new products. In some of its latest derivatives, it proves a veritable elixir of life. If you get sick, drugs based on hydrazine may make you well.

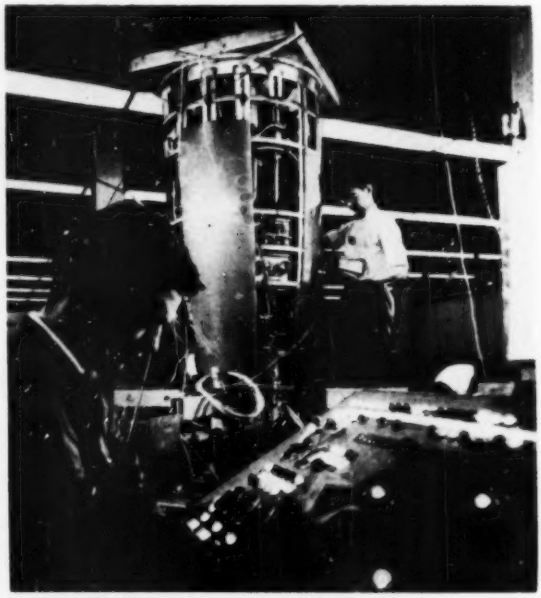
Other hydrazine compounds will help you control weeds, and even keep the grass of your lawn at just the right height, saving frequent mowing. You can buy your children a wonderfully light beach board made with the help of a hydrazine derivative. Under development is a whole family of new plastics, dyes, textiles and other products, all based on hydrazine.

What Hydrazine Is

The men who handle rocket water wear rubber gloves and goggles, for it is toxic and corrosive. It smells like ammonia, of which it is a close relative. Both consist of nitrogen and hydrogen. Hydrazine has the chemical formula N_2H_4; ammonia, NH_3. In other words, a hydrazine molecule contains two atoms of nitrogen and four of hydrogen, instead of an ammonia molecule's one atom of nitrogen and three hydrogen atoms.

A German chemist, Emil Fischer, predicted the discovery of hydrazine and named it as long ago as 1875. Isolating it took 12 years more, and the chemists who worked with it later found it hard to make and extremely costly. It might have remained little more than a chemical curiosity but for a startling development during World War II—rocket-powered planes, introduced by the Germans late in the war.

To produce a lightweight, high-energy fuel for these planes, the Germans in 1944 disregarded costs and built the first two sizable hydrazine plants. The process used was originally devised by Friedrich Raschig in 1907. A familiar bleaching agent, sodium hypochlorite, broke down ammonia. The products—chloramine and caustic soda—reacted with more ammonia to form common salt, water and hydrazine. Simple as it



GUIDED-MISSILE TESTS using hydrazine, and other fuels, have been under way at Army Ordnance test station, Malta, N. Y. Above, engineers check wiring of prototype model.

sounds, making it work was a headache. Hydrazine tended to break down before it could be recovered. And at best, the output contained only about two percent of hydrazine, and had to be concentrated. Nevertheless, the larger plant of the two produced more than 40 tons of hydrazine monthly.

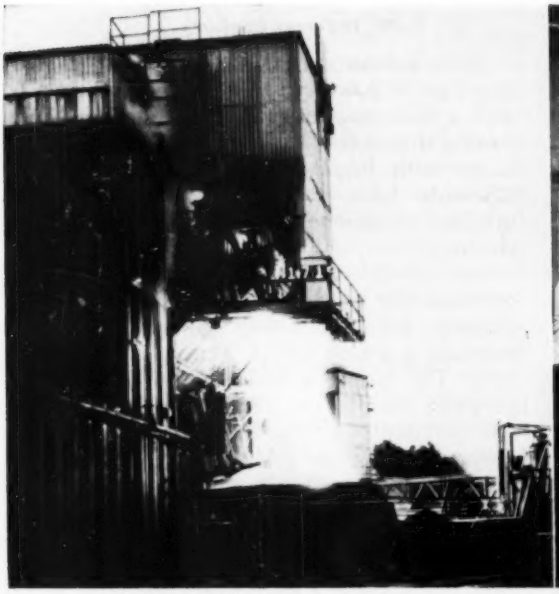
It was hydrazine that provided much of the zip for the world's first rocket plane—the German's Me 163 interceptor. Its Walter rocket engine was fueled by a combination called T-Stoff and C-Stoff. T-Stoff was hydrogen peroxide, and supplied oxygen for burning the fuel. C-Stoff was hydrazine and wood alcohol, with a dash of copper salts to speed hydrazine's explosive reaction. The 415-pound engine, developing a maximum thrust of 3,740 pounds, gave the plane a climbing speed of seven miles a minute and a top speed of 590 miles per hour. Hydrazine helped fuel a second rocket fighter, the BP-20.

After the war, U. S. scientists and engineers consulted with German rocket authorities, and studied the German hydrazine-making technique. Soon our armed forces began letting contracts for experimental work with hydrazine. In one such project, rocket motors burning hydrazine and other fuels have been undergoing trials in concrete-walled pits of Army Ordnance's 3,000-acre rocket station near Malta, N. Y.

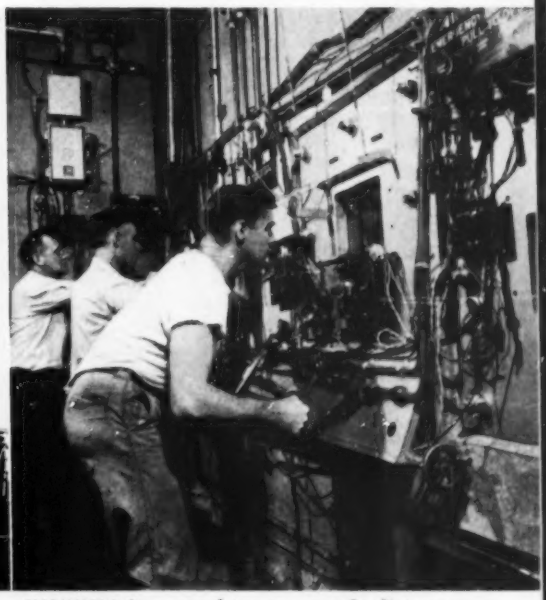
Secrecy Cloaks Progress

Results are hush-hush, and military men aren't talking about what fuels are currently used in our guided missiles. But the experts can point out this much without violating security: making hydrazine requires no strategic materials. It's easy to handle and store. As a fuel it's packed with energy, readily releasable. It ignites spontaneously and burns rapidly on contact with nitric acid or hydrogen peroxide, which act as oxidizers. It breaks up into lightweight particles that zip away at high speed, and so produce a powerful thrust.

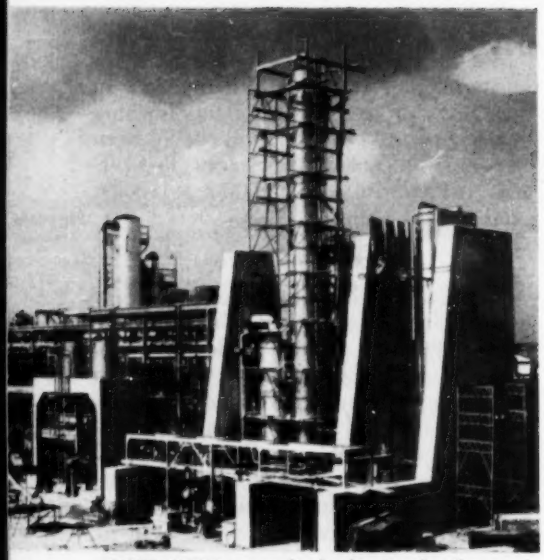
These facts make hydrazine one of



ROCKET ENGINE roars into life as propellant is ignited in one of station's concrete test pits. Some of the models tested have developed a thrust of upward of 35,000 pounds.



ENGINEERS in control tower, at safe distance from test pit, work valves governing flow of fuel and watch through windows. Emergency control will douse pit with sprinkler system.



FIRST IN U.S. to make hydrazine by the ton is this new $3,000,000 plant at Lake Charles, La. Massive concrete bulkheads (foreground) are to limit damage in case of an explosion.

the most promising of rocket fuels, perhaps *the* most promising. And it's no secret that U. S. production of "rocket water" is undergoing an unprecedented boom, with most of American makers' current output going to meet the needs of the armed forces.

Big U. S. Output Starting

Really large-scale U. S. production of hydrazine is just getting under way. With completion last year of a $150,000 plant at Newark, N. J., the Fairmount Chemical Co., a pioneer American maker of hydrazine since 1940, quadrupled its output. And now a great $3,000,000 hydrazine plant at Lake Charles, La., has been put in operation by the Matholin Corp.—a new company devoted to manufacturing hydrazine, and conducting research on it, formed jointly by the Mathieson Chemical Corp. and Olin Industries, Inc. Military requirements are expected to take most of this plant's initial output, but it will also be able to supply a growing demand for hydrazine for non-military uses, its sponsors say. And although the Lake Charles plant's exact capacity is cloaked in military secrecy, they call it the first in this country to make hydrazine "on a tonnage scale."

Basically the method remains the Raschig process that the Germans used, but in U. S. producers' hands it has undergone important engineering improvements. And ways have been found to remove most of the 36 percent of water that the final German product contained, so that anhydrous or virtually water-free hydrazine, superior for many applications, is now commercially available.

The chemical is shipped in stainless-steel drums, from which air has been excluded by pumping in nitrogen gas. This meets safety requirements for transportation by truck or rail. In a closed space, hydrazine vapor and air would form an explosive mixture, which could be touched off by heat, a static spark or even simply by contact with certain iron or copper compounds. But in the open, hydrazine is considered fairly safe to handle, no more dangerous in fact than gasoline.

2,000 Different Products

As an industrial raw material, hydrazine may be transformed into substances with a wide range of chemical structures —more than 2,000, at latest count, and many with brand-new characteristics. Chemists have already developed a number of commercially valuable derivatives.

One of the most spectacular is the chemical that can help you have a well-groomed lawn with only one or two mowings a season (PSM, March '53, p. 123). This is maleic hydrazide, or MH for short, made by the Naugatuck Chemical Division of U. S. Rubber Co.

Sprayed on grass, MH retards growth for six or eight weeks. It also looks good against certain weeds, particularly wild onions and garlic. Recent tests indicate, too, that it will help control quack grass, the bane of many a home gardener. (In these tests, the weed was sprayed with MH and plowed under. Then a crop was planted.)

MH will do more important work. Sprayed on onions two weeks before they are harvested, it keeps them from sprouting all winter—without affecting color, odor or flavor. Potato plants sprayed with it yield a crop that can be stored without loss of sugar content. Tobacco plants treated with it won't produce suckers—a secondary growth that cuts both yield and quality.

Hydrazine Attacks Poultry Disease

Other hydrazine products have agricultural value. Added to feed, one helps to prevent the poultry disease, coccidiosis. Another kills mites without killing the birds that feed on them. Others look like good insecticides.

Starting with hydrazine, U. S. Rubber Co. chemists have developed a new blowing agent—the thing that puts the sponge in sponge rubber and sponge plastic. The company calls it Celogen but chemically it is benzene sulfonyl hydrazide, or BSH. At normal temperatures, BSH is a white powder, but add it to a batch of rubber or plastic at temperatures above 135 degrees C., and it breaks down and liberates nitrogen gas. This leavens the material much as carbon dioxide, produced through the action of yeast, leavens bread.

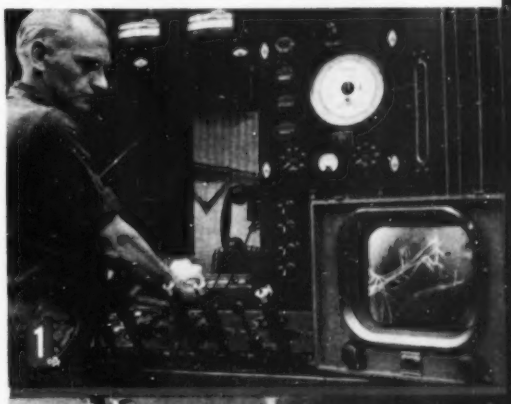
One BSH end product is a beach board made of vinyl-plastic sponge. It weighs only 12 ounces, and its millions of tiny nitrogen-filled cells enable it to support up to 150 pounds in the water. More possible end products: sock pads, aircraft-wing lining, rug underlays, fishing floats, mine-cable floats, life rafts.

Yields Life-Saving Drugs

Using hydrazine in a different way, chemists get drugs for saving life. Most dramatic of these, to date, has been the new antituberculosis drug INH—short for isonicotinic acid hydrazide. Now an improved form called streptohydrazid has been announced by a Brooklyn pharmaceutical firm, Chas. Pfizer & Co. It combines the two most effective anti-TB drugs, INH and streptomycin, and is

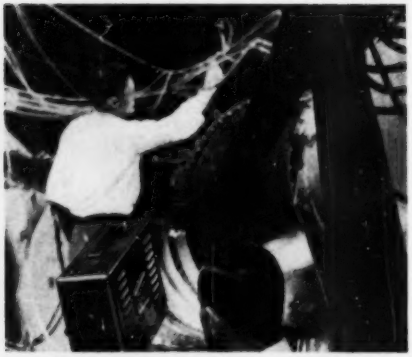
[*Continued on page 262*]

What Are They Watching on Television?

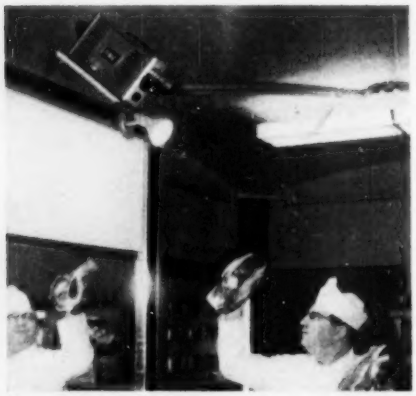


The pictures that interest these three people are far, far removed from "Lucy." Can you guess what they are? Turn the page for answers.

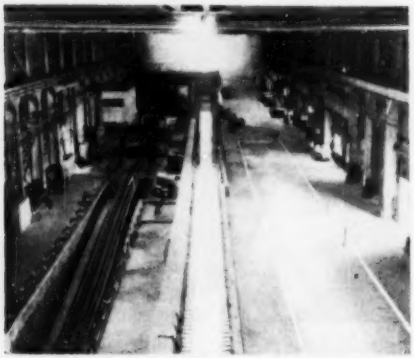
...TV on the Job



1 **AIRPLANE-ENGINE TESTS** are televised by Pratt & Whitney. Engineer (photo No. 1, preceding page) sees instrument wires.



2 **BUTCHER SHOWS HIS WARES** to residents of Chicago apartment hotel. Shop is connected to the hotel's master antenna.



3 **RED-HOT STEEL STRIP** is telecast as it leaves rolling mill to let operator "see" around water sprays and control the mill.

Welded-Steel "Basket Handle" Bridges River in Mexico

Mercedes Flips Its Grille

LIFT the hood of the German Mercedes 180—and the radiator grille comes right up with it. The four-cylinder, 52-horsepower engine boots the new car along at better than 78 miles an hour, putting 27 miles behind it for every gallon of gas swallowed.

INCLINED steel arches welded together at the top are the unusual support for this new bridge over the Rio Blanco near Veracruz, Mexico. It's painted, too—the arches orange, the horizontal tie girders cherry red. The design idea won a Lincoln Arc Welding award for Dr. Thomas C. Kavanagh of New York University.

Wanted: Hot-Weather Cow

THIS bossy is masked for breathing in a climate chamber so researchers can tell how well she can take it in the deep South. It's part of a government crossbreeding program to produce a cow that won't hit a low in milk flow when temperatures soar.

B-36 Doubles as Cargo Carrier

THAT old warhorse—the B-36—is hauling freight now. In each wing-pod saddlebag, the bomber above toted two B-36 engines and two quick-change engine assemblies across country to show how plane parts could be shuttled to and from forward areas.

Nash Hikes Compression,

This L-head has the highest compression yet, but it still does its stuff on regular gas.

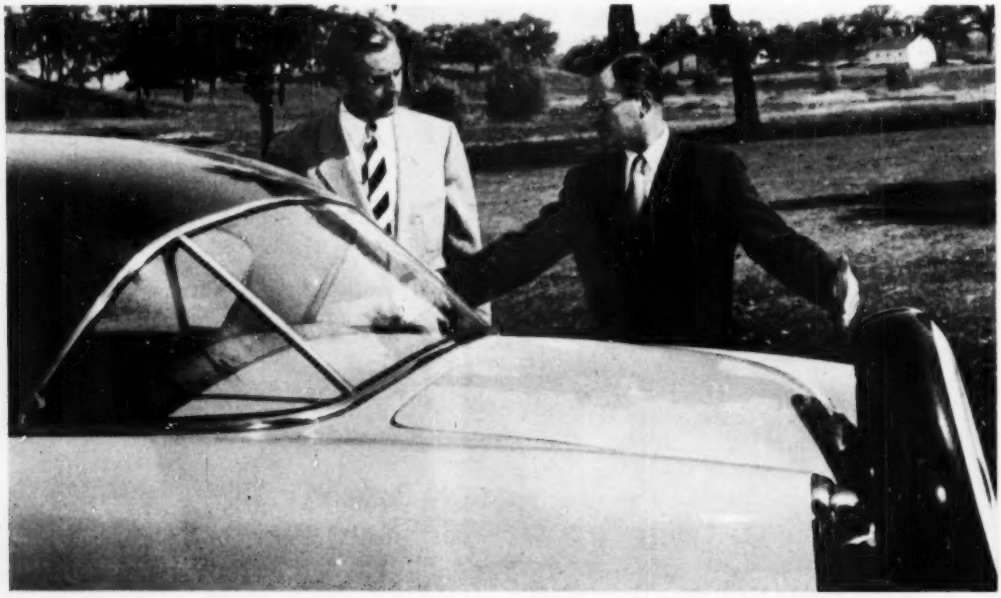
By Wilbur Shaw

THE Nash Statesman for 1954, sparked by a whopping 8.5-to-1 compression, cuts a good middle course between lively performance and comfort.

For years this Kenosha, Wis., outfit has puts its emphasis on comfort. Its cars have been noted for soft ride, fancy upholstery, double beds, and reclining seats. With this model, which shares with Buick the highest compression among U. S. stock cars and has the highest compression of any L-head, Nash has definitely changed its emphasis to engine.

The Statesman you'll see next year won't look much different—an altered hood line, restyled grille, and a Continental spare. But if you get in and drive it, as I did, the changes will be about as striking as the Petty-girl ornament on the prow.

The six-barrel L-head is basically the same engine that Nash has been using in



THAT'S PLENTY of cargo space in there, and for '54 it's made even bigger by hanging the spare outside. Apart from the fact that the car looks snappier, an outside spare means you don't have to unpack luggage on a roadside if you get a flat on a trip. That shelf behind the rear seat is steel—not fiberboard.

DUAL SPEAKERS—there's one like this on the other side too—let you catch soap operas or news with both ears. This seat folds down at night to make part of a double bed but doesn't recline for daytime snoozing like the other half of the front seat—too many guys are asleep at the wheel already.

Puts Spare Tire Outdoors

its middle line of cars for years. The idea this year was to put a more powerful car on the road but still use this proven block and regular gas. Main problem: how to get more horses without letting it ping like a bunch of Swiss bell ringers.

Earl Munson, chief engineer at Kenosha, told me that his boys simply stole a glance at some favorite hot-rod tricks. They tossed in some of Nash's own, with this result: 110 horses, 10 more than last year, plucked from a 195-cubic-inch engine. The bigger Ambassador has been hiked from 120 to 130 hp.

First, they relieved the "dam" of iron in the standard block between the top of the cylinder wall and the valve ports. This lets the fuel mixture and the exhaust whip in and out in a straight line. Then they tossed out the old cast-iron head and substituted a high-compression aluminum one.

Munson explained why Nash went to aluminum:

"If you want more power from the same engine, one way to get it is to boost compression. Then you get both higher compression pressure and temperature, with resultant knock. You get it, that is, unless you avoid it by lowering either pressure or temperature.

"That's where the aluminum head

CONCAVE GRILLE is the most conspicuous style change in the new Statesman. When I first saw the car coming, I thought it was floating loose in there. Hidden brackets hold it.

PULL-OUT BIN in the center takes all those odds and ends that come tumbling out of an ordinary glove compartment whenever you open the door.

CONTINENTAL SPARE doesn't interfere with access to the luggage compartment. Outdoor spare is standard on a new Nash Rambler four-door built on a longer 108-in. wheelbase.

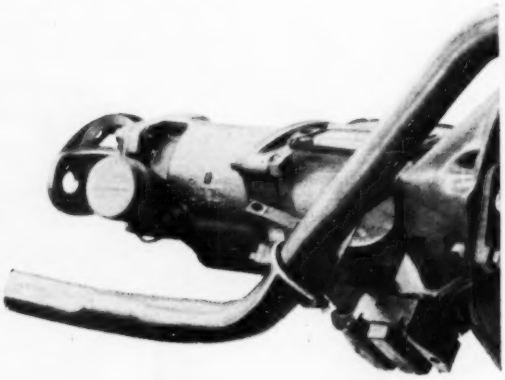
comes in. It dissipates heat much faster than iron. There's a simple formula to illustrate the problem:

"Using the letter P for compression pressure, T for temperature, and PK for maximum permissible knock, we can set up a formula, P x T = PK. Let's say that PK in this case is 12. So for our purposes no product of P and T can be more than 12. Suppose with the older engine P is 4 and T is 3. That's all right, but we want to get more horsepower, and we want to get it by raising compression without raising PK above 12.

"The solution we found was to lower the compression temperature to, say, 2—which let us raise the pressure to 6. You can see that a cooler aluminum head is a vital link in the process."

With their relieved block and high compression, the engineers had a hot baby on their hands that gulped for air and put out exhaust at unusual rates.

DUAL CARBS take air from the filter through a big tee connection. That aluminum head helps Nash run at 8.5 compression on ordinary gas. There's a new straight-through muffler that slices maximum back pressure in half, with a resonator on it to preserve Nash's typically quiet purr. They did things inside this power plant too—enlarged the intake manifold, relieved the block a little, put in bigger valves and a high-lift cam. Those two asbestos-covered lines running up from the exhaust manifold lead heat to automatic chokes—the carbs themselves sit on insulating gaskets to protect them from engine heat and vapor lock.



Dual carbs, improved valves and cam shapes, and a new exhaust system were next on the docket.

After we went over the engine, I took one of the four-door sedans out on Nash's track. The ride is amazingly soft, and the car handles about as well as you could wish for with such gentle springing. We got up to 80 easily on the 1¼-mile oval, but since the track is only slightly banked, I didn't try to shove the sedan higher. There was plenty of pedal left.

Braking was good. They have widened the front brake shoes from 2 to 2½ inches. I am glad that Nash is one company that doesn't just put in more power and let it go at that. END

FACTS ON '54 NASH STATESMAN

Model: Statesman four-door sedan.

Engine: 6-cyl. L-head; 110 hp. at 4,000 r.p.m.; compression ratio, 8.5:1; piston displacement, 195.6 cu. in.; bore and stroke, 3⅛" by 4¼"; piston travel (in feet per car mile at 20 m.p.h.) 1,766.96; torque, 155 lb.-ft. at 2,000 r.p.m.

Weight: 3,045 lb.; per hp. 29.0.

Transmission: 3-speed manual shift; overdrive or Hydra-Matic optional; rear-axle ratios, 3.6:1, 4.4:1, 4.9:1.

Steering ratio: 24:1; radius of turning circle, 21'3".

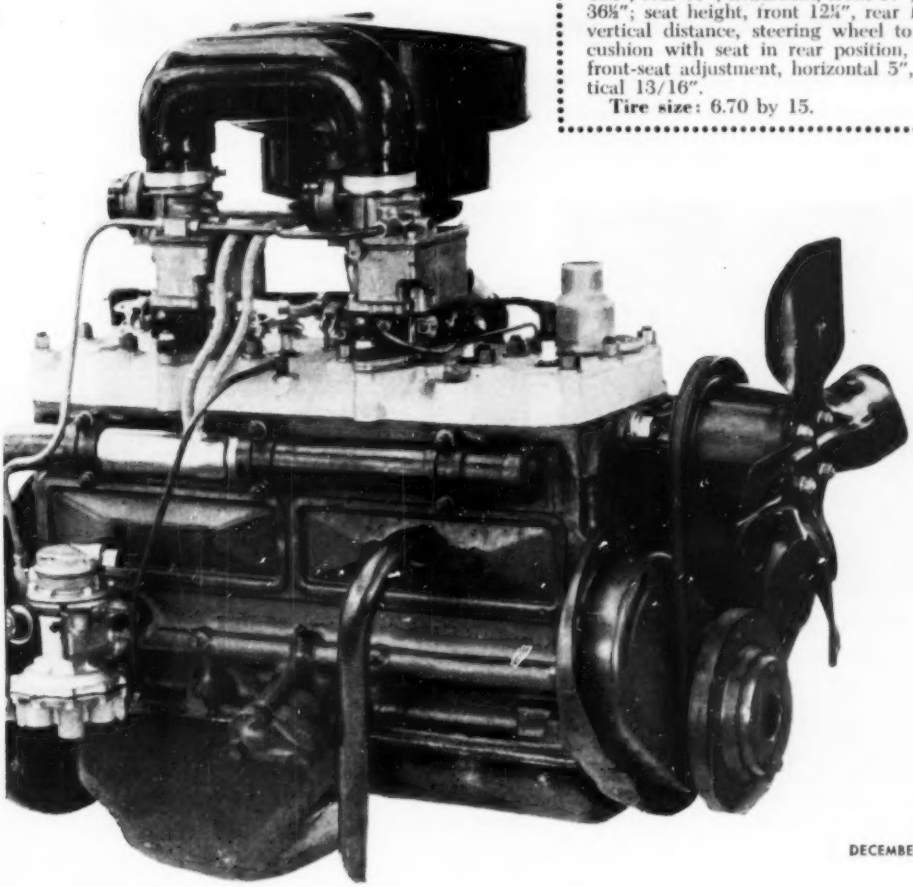
Effective brake-lining area: 149.2 sq. in.

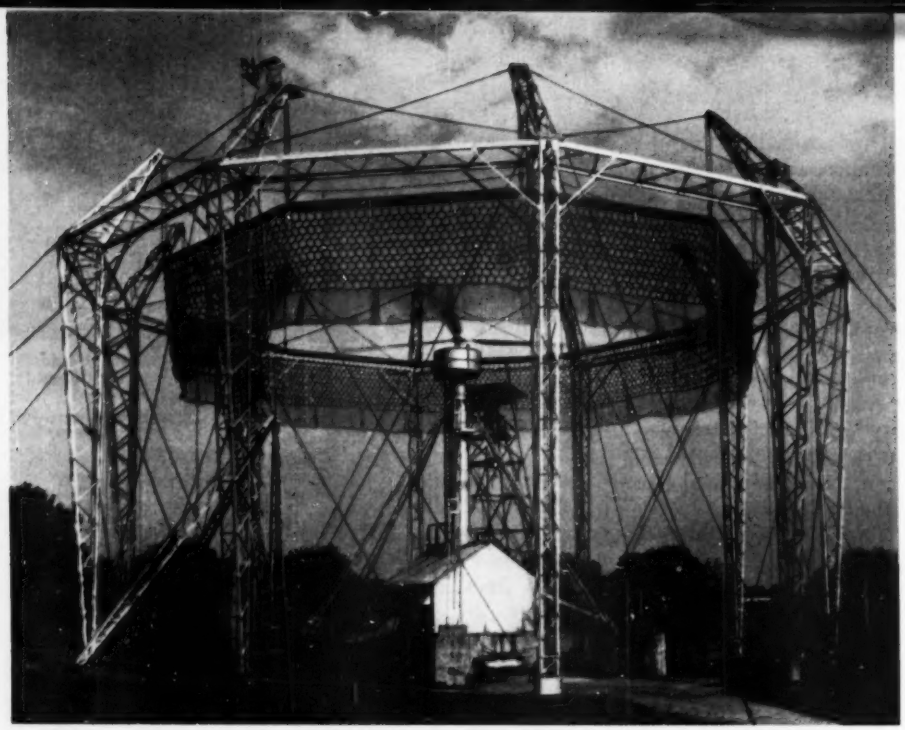
Springs: coil, front and rear.

Outside dimensions: height, 61⅜"; over-all length with bumpers and guards, 202¼"; width, 78"; wheelbase, 114¼"; overhang, front 34 15/16", rear 53 1/16"; tread, front 55½", rear 59 11/16".

Inside dimensions: seat-cushion width, front 65", rear 64½"; leg room, front 41½", rear 39"; headroom, front 37", rear 36½"; seat height, front 12¼", rear 13⅞"; vertical distance, steering wheel to seat cushion with seat in rear position, 6⅝"; front-seat adjustment, horizontal 5", vertical 13/16".

Tire size: 6.70 by 15.



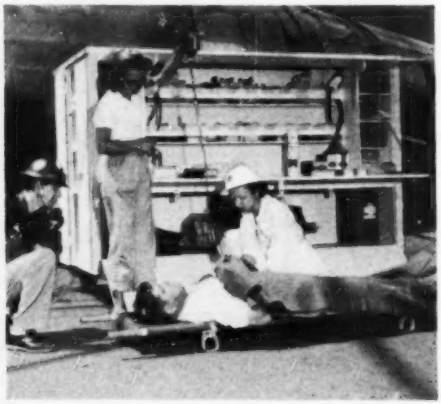


Helicopter Blades Go for a Test Whirl on "Merry-Go-Round"

SPUN by a 700-horsepower electric motor, rotor blades for Britain's Bristol helicopters get strength and flutter tests on the odd-looking structure pictured above. Rotors up to 70 feet in diameter are given a dizzy whirl on the center tower.

Torch Burns Holes in Concrete

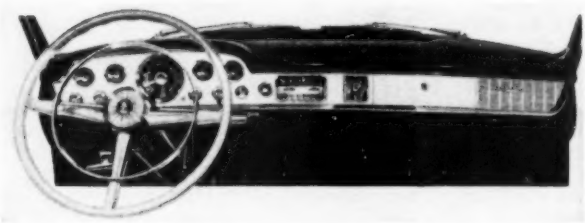
SHOOTING a flame of 8,000 degrees F., the cutting rod above, called DynaTrode, burns in mid-air with no ground connections. It eats into concrete an inch a minute. It is used with DC welding machines but its cables feed through rod to tip, where arc is created. Eutectic Welding Alloys Corp., Flushing, N.Y., makes it.



First-Aiders Roll to Rescue

WHEN an accident occurs in the Convair plant at San Diego, the first-aid station can be rolled to the spot. It's a huge chest mounted on four wheels, and it contains everything essential for emergency treatment, from iodine to plasma. Above, one mobile unit is shown in action during a recent civil-defense drill.

De Soto Ups Horsepower for 1954



INSTRUMENT PANEL, closer to driver, has separate dials. Radio speaker is at far right, glove compartment to its left.

TEN horsepower and a high-performance transmission have been added to the 1954 De Soto V-8 to give the car more snap when the light turns green.

A little longer and wider, the De Soto now extracts 170 hp. from its hemispherical-head cylinders. Compression ratio has been boosted from 7.1:1 to 7.5. The optional automatic transmission boasts the highest over-all torque multiplication in the industry —4.47:1.

Like other cars in the Chrysler Corp. line for '54, the De Soto has a new front suspension to cut down body roll on turns. The company continues to offer the 116-hp. six-cylinder engine in five models.

FACTS ON '54 DE SOTO

Model: convertible.

Engine: V-8 with overhead lateral valves; 170 hp. at 4,400 r.p.m.; compression ratio, 7.5:1; piston displacement, 276.1 cu. in.; piston travel (in feet per car mile at 20 m.p.h.), 1,410; bore and stroke, 3⅜" by 3 11/32"; crankshaft bearing surface, 43.8 sq. in.; torque, 255 lb.-ft. at 2,000 r.p.m.

Weight: 4,170 lb.; per hp., 24.5 lb.

Transmission: PowerFlite automatic (torque converter); rear-axle ratio, 3.54:1.

Steering ratio: 16.2:1 (25.8 without power steering); radius of turning circle, 20', 9½".

Effective brake-lining area: 201 sq. in.

Springs: front, coil; rear, semi-elliptic.

Outside dimensions: height (to top of windshield), 59 3/16"; over-all length with bumpers and guards, 214½"; width, 77⅝"; wheelbase, 125½"; overhang, front 37", rear 52"; tread, front 56 5/16", rear 59⅝".

Inside dimensions: seat-cushion width, front 61½", rear 60⅝"; leg room, front 44", rear 41⅝"; seat height, front 14⅝", rear 14¼"; vertical distance, steering wheel to seat cushion, with seat in mid-position, 5⅝"; front-seat adjustment, horizontal, 5", vertical 1⅝".

Tire size: 7.60 by 15.

P.S.

Last minute news & notes...

MORE OF THE LONG, LEAN EUROPEAN LOOK may be in store for U.S. cars, rumors Detroit. Surprisingly, the new contour is expected from the most conservative (in styling) of the Big Three. Chrysler Corp.'s new boss stylist is Virgil M. Exner, the man responsible for the '46 Studebaker. He says, "For 1955, it's . . . a more slender car." . . . The H-bomb isn't forgotten by Plymouth engineers. They will mark their '54 car radios with the Conelrad frequencies to which all stations will switch in the event of air attack. . . . Spare gasoline engines are being installed in some German trolley buses: they let the motorman leave the wire line temporarily to get out of a traffic snarl.

INDIA'S MOVIE INDUSTRY RANKS SECOND only to the U.S. in feature-film production, statistics from the United Nations reveal (see chart). Italy, source of many of the most famous postwar movies, is way down in seventh place in quantity.

WHO MAKES THE MOST MOVIES?

COUNTRY	EACH SYMBOL REPRESENTS 200 LONG FILMS
UNITED STATES	
INDIA	
JAPAN	
UNITED KINGDOM	

CHEAPER COLOR TELEVISION is promised for both viewer and broadcaster by newly developed equipment. Columbia Broadcasting System has unveiled a new color viewing tube much simpler in construction than RCA's (PSM Nov. '53, pp. 122-3). At the first press demonstration, however, the color picture produced on it was disappointing. For broadcasters, CBS showed how small, relatively cheap rotating-disk cameras could be used in the studios, their signals being converted in the control room to the NTSC color system. . . . An apparent record for long-distance TV reception has been set by a London fan, Charles W. Batley, who picked up Oklahoma City's WKY-TV.

WATCH YOUR AIM if you use one of those new tools employing blank cartridges to drive wall fasteners. One carpenter didn't, California police report. His nails missed the studding, went through the wall, killed a man who was working in an adjoining room.

VACCINES against two dreaded plagues --polio and TB--are closer to reality. The National Foundation for Infantile Paralysis will spend $7,500,000 next year on production and test of the new polio vaccine. Gamma globulin--$19,000,000 worth --will also be used pending completion of the vaccine trials. The tuberculosis preventive was developed at the University of Michigan, has been tried successfully on animals but not on people . . . Antibiotic ice--flake ice containing a minute quantity of aureomycin--keeps fish fresh longer, report Canadian experimenters . . . And milk will stay sweeter longer if the cows are fed a little of a chemical called menadione, according to scientists at Florida State University.

WOMEN DRIVERS may deserve some of the things men say about them, concludes a New York University researcher who checked speeders by radar last summer. He found that 53 percent of all speeders he clocked were women, but reports that nearly everybody broke the traffic laws--even in front of a state-police barracks . . . A whole town in Long Island may be "punctureproof," for a while anyway. The Rubberseal Corp. plans to test its self-sealing tire compound by treating--free--every tire in the community . . . A new cold-weather oil promises easier starting even on 30-below mornings. Gulf claims its product won't evaporate as readily as other light oils.

ALUMINUM STOCK that you'll find at hardware stores includes tubing, bar, angle, rod, sheet, decorative molding and special moldings for storm windows and screens. The sheet, in 3'-by-3' squares, comes both plain and embossed to simulate leather. Long stock, in 5', 6', 7' and 8' lengths, includes these sizes: tubing, ¾", 1", 1¼"; bar, ⅛" by ¾"; ¼" by 1"; angle, 1" by 1"; rod, ⅜". You'll also find aluminum screws and rivets.

You Can Use Aluminum Like Wood

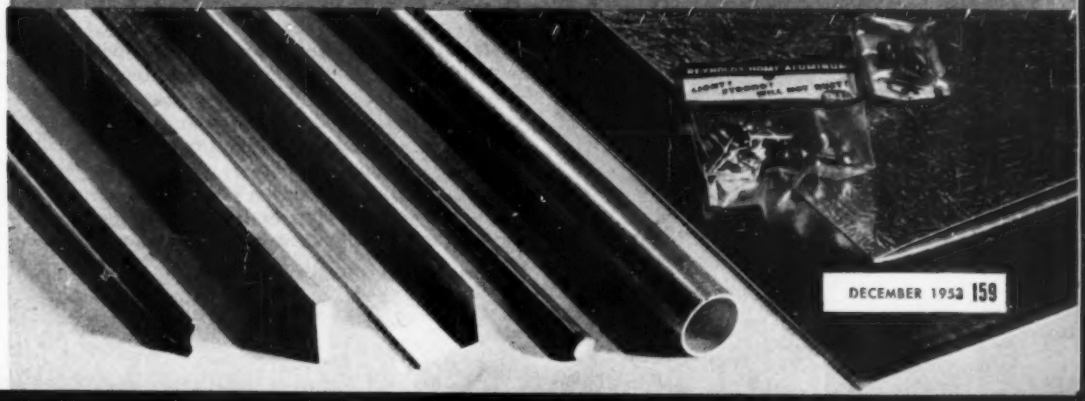
Even the man who never worked with metals before can now make many useful projects.

By Herb Pfister and Harry Walton

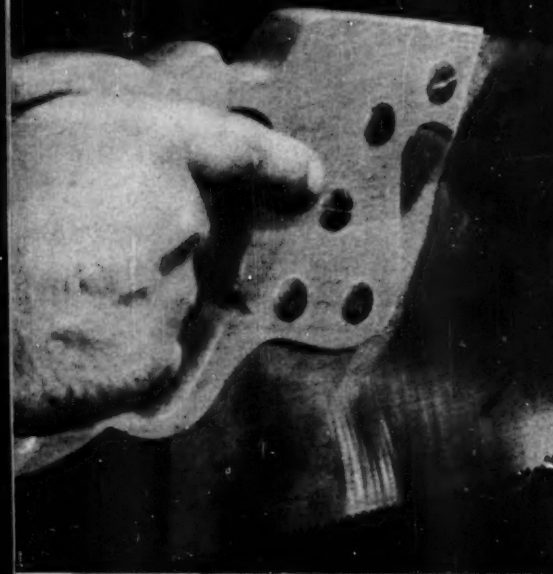
IF YOU think material other than wood is not for you, if you believe metal projects are beyond your skill, take a look at the shiny stock shown here. It's metal with a difference—handsome, strong and as easy to use as clear pine.

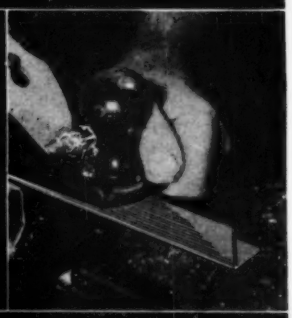
It's "do-it-yourself" aluminum, especially made for the householder and home mechanic. You cut, smooth, bore and shape it with the tools you already have—common, everyday woodworking tools.

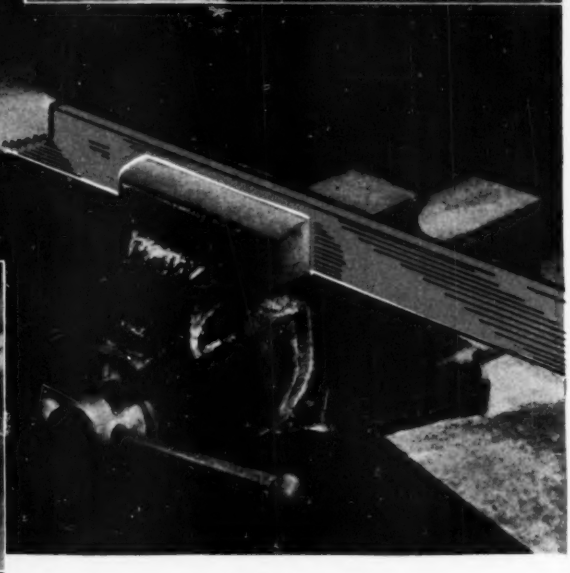
It won't damage tools. Saw it with your pet crosscut saw. Plane it like wood. Bore it with your best auger bit. Let a

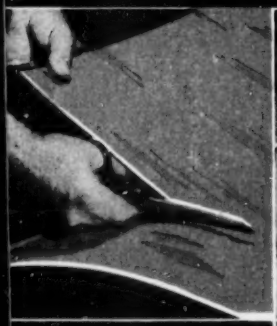


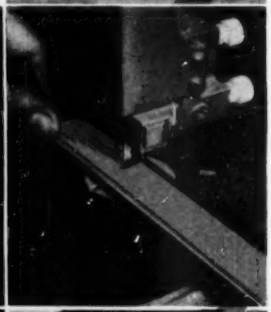
Any Tool That Cuts Wood Cuts This Aluminum

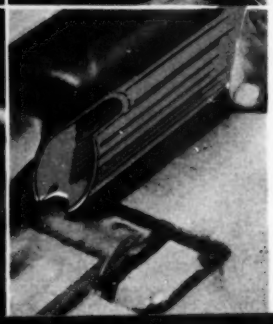












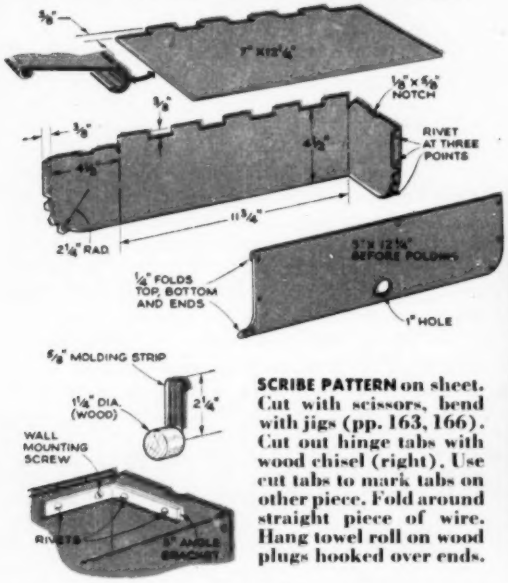
circular saw sweep through it. Use a power jointer to straighten an edge or cut a flat through tubing. The tools will still have their original sharpness.

Finishing is no problem. The aluminum takes lacquer, paint or enamel beautifully, although it already has a permanent, non-rusting surface that you can buff as bright as silver or sand or wire-brush to a satin sheen.

At your hardware store. Right about now this aluminum, produced by the Reynolds Metals Co., should be appearing in your neighborhood hardware store in various shapes and sizes. You'll find two shapes designed for special jobs—a molding for making your own aluminum storm windows easily and economically, and a rolled shape for making window screens. Aluminum

You Can Build Towel Holder

Embossed-sheet box holds paper roll, and bar below is for cloth towels.



SCRIBE PATTERN on sheet. Cut with scissors, bend with jigs (pp. 163, 166). Cut out hinge tabs with wood chisel (right). Use cut tabs to mark tabs on other piece. Fold around straight piece of wire. Hang towel roll on wood plugs hooked over ends.

rivets, self-tapping screws and machine screws for assembling your projects also will be available—in plastic bags.

Working tips. Although the metal does no harm to a circular-saw blade, bits of aluminum adhering to the teeth give a fuzzy finish to wood that is cut later. These bits can be cleaned off by rubbing a cloth on each side of the blade in the direction of the teeth points. Feed the metal slowly into power tools to prevent overheating and give chips a chance to clear. A piece of scrap wood placed over work being cut will minimize flying chips. Otherwise eye-protecting goggles are a good idea. But don't be carried away and try to cut just any aluminum alloy you happen to have with woodworking tools. It may be harder and damage the cutting edge.

Joining and fastening. Sheet aluminum crimped with a wooden jig can be interlocked along the edges for a permanent joint. Holes can be punched in moldings and sheet with a nail.

Aluminum is notoriously hard to solder, but some special soldering alloys come in handy for small projects. One fluxless solder* is simply rubbed on after the aluminum is brought up to 600° with a small gas torch. The coating that results forms a base for making ordinary solder stick, or the alloy itself can be used to make the joint.

To try out this aluminum, POPULAR SCIENCE MONTHLY built a variety of projects. Notes on these follow.

Towel holder (above). The back and ends are bent from one piece. To form hinge tabs, chisel out between scissor slits. Roll the front after making ¼" folds on all sides. Join the folded edges and ends of the housing with aluminum rivets. Reinforce the holder by riveting a 3" iron angle bracket inside each rear corner.

Luggage rack (see page 162). The frame was made 3' square to get the most out of 6' lengths of angle. It is reinforced by an aluminum bar at each end, the bar protruding 4" on each side. Bent down to the roof contour, these protruding ends take the suction cups and drip-molding straps.

When bending the tubing, pack sand

*CHEMALLOY, *Sightmaster Corp., New Rochelle, N.Y.*

inside to prevent kinking. The first bend must be correct. You can't straighten and bend it again.

Storm sash (see page 164). Aluminum screen bent over a thin wire frame can be used to replace the lower pane of glass, giving you an effective sash for both winter and summer. But to do this, you'll have to take the frame apart to substitute the screen for the glass.

Although cutting the miters with a bench saw is faster and assures more accuracy, you can do the job with a handsaw by working carefully.

Fireplace screen (see page 165). Since the panel area is larger than six sq. ft. (which calls for a cross brace in a window screen), take special pains to stretch the wire or hold it flat with weights while driving in the plastic spline.

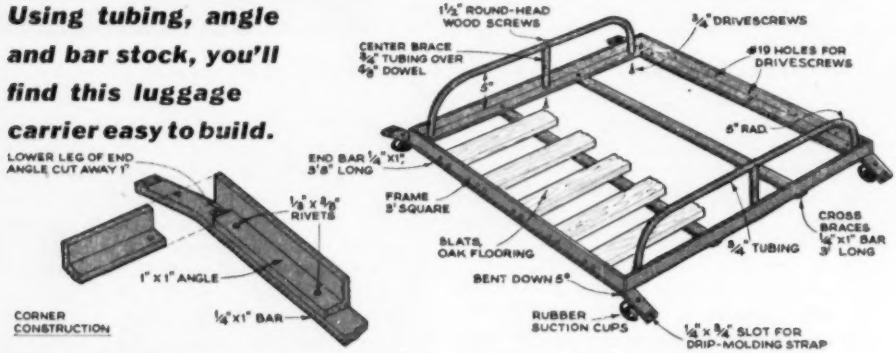
Modern railing (see page 166). Cement poured into 1" tubing gives rigidity to the supporting posts. Use a ready mix or mix one part cement to two of sand.

Holes can be made in concrete steps for the supporting posts by using a star drill or carbide-tipped masonry drill to make a series of small holes around a 1½" circle. Chip out the concrete inside the circle with a cold chisel and hammer.

Hardwood dowels forced into the ends of the tubing make assembly a wood-screw job. Uniform bevels on the ends of tubing over the steps can be cut on a bench saw, using the miter head set to the proper angle.

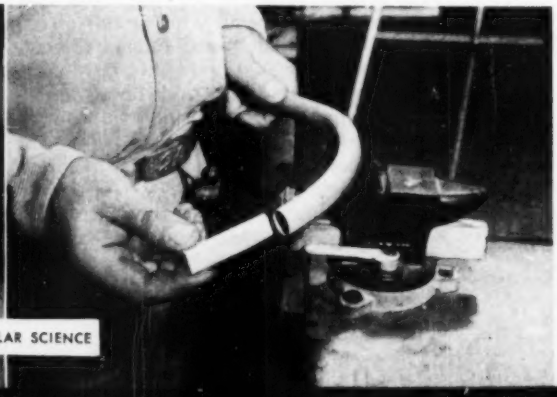
Aluminum Car Rack Lightens the Load

Using tubing, angle and bar stock, you'll find this luggage carrier easy to build.

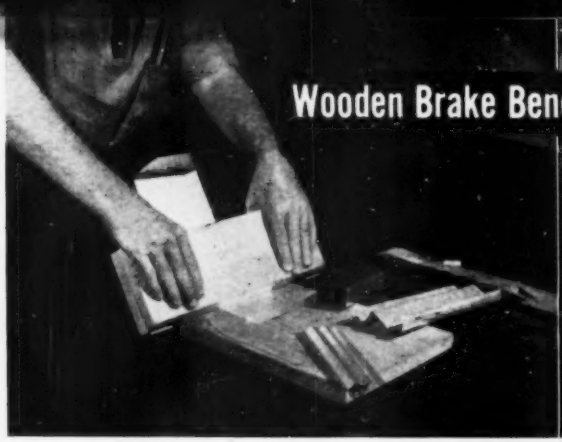


1 TO FORM SIDE RAILS, bend sand-filled tubing around end of board cut to 5" radius. Wood strip nailed to bench holds tubing against bending board. Use husky bolt or pipe in tubing for extra leverage, ramming it tight against sand. Plug opposite end.

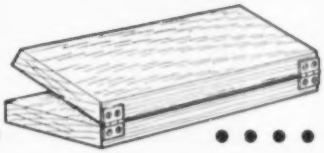
2 PLUG SIDE-RAIL ENDS with hardwood dowels after shaking out sand and cutting off excess tubing. Join rail to frame by driving screws through bottom leg of frame angle into the dowels. Small screws through side of tubing keep dowels from twisting.



Wooden Brake Bends Sheet Aluminum



HOMEMADE BENDING BRAKE consists of two pieces of hardwood hinged on one edge near ends. Bevel hinged edge of one as in sketch. Clamp pieces together with cardboard between and screw on hinges. To use, slide in sheet aluminum until bend line lies along hinged edge. Place on wood block narrower than hinge spacing (left above), hold fast and fold over. Brake can be opened to remove bent stock (right above).

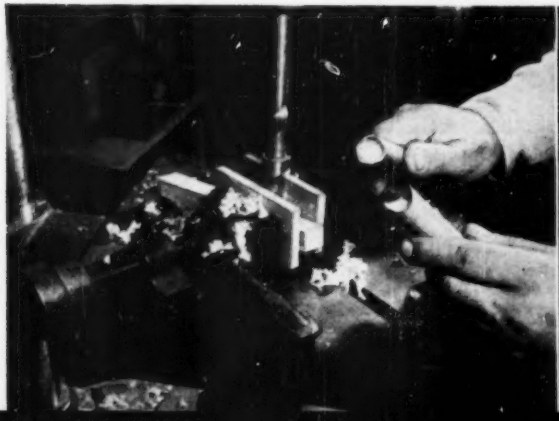


ROOF-HUGGING AND STURDY, rack can be installed in less than a minute after you have finished it. Suction cups and straps can be bought at auto-supply stores.

TRIAL FITTING checks frame and fit of suction cups on top. Make frame of 1″-by-1″ angle and rivet it to heavier bar at each end. Rivets flatten easily between two hammers.

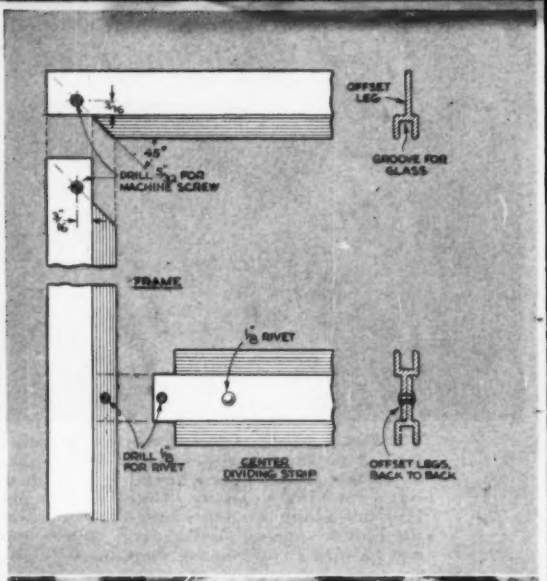
3 SHAPE MATING JOINT on top ends of center braces by boring through tubing with wood bit of same diameter. If you have no drill press, use rattail file to shape end. Force 5″ dowel into braces to receive screws driven through rail at top and angle at bottom.

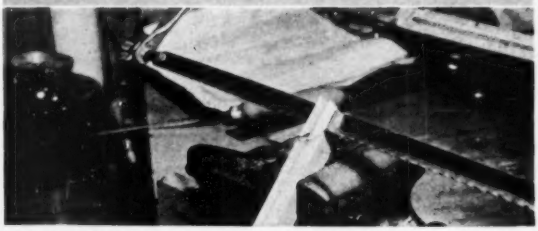
4 USE HARDWOOD SLATS, fitting them inside frame and driving two screws into each end. Oak flooring is well suited to job of supporting heavy loads. Rip tongue and groove off each piece. Turn molded side up for best appearance. Varnish for weather protection.



Fuel-saving sash are made with extruded strip that bolts together, has groove for glass.

Storm Windows and Screens

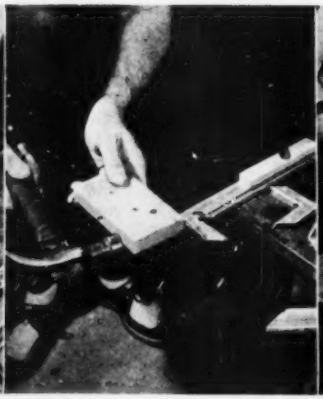




2 GROOVED BIT is cut away, leaving flat tab to be bolted or riveted to adjoining piece. Center rail is made up of two pieces, joined back to back, with grooved parts cut back.

Screen molding comes with preformed corner clips and plastic strip

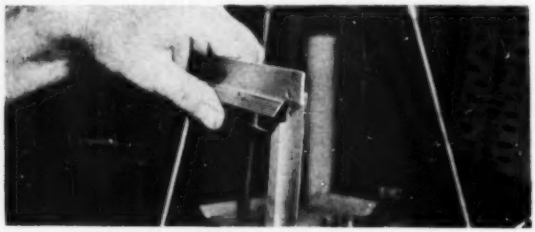
TO MAKE A SCREEN, cut special lock-strip molding to fit in window casing. Measure along edge opposite the recess and cut 45° miters. Recess must be on inside of cut, at short end of miter. Homemade miter box speeds the job.



DEBURR cut ends and drive in corner clips. Clamp strip to bench top and hammer against a wood block. Join three sides, drive clips into ends of fourth, and hammer each end alternately into its adjacent side until frame comes together.

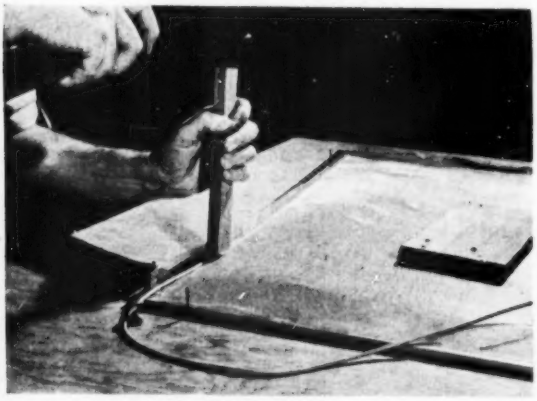
CUT SCREENING (preferably aluminum, to avoid electrolytic action) to size of frame. Snip off a corner just outside point where recesses meet. Using strip of wood that fits recess, drive screen in one side. Lay plastic welt on top.

1 CUT OUTSIDE PIECES to exact length to fit a window casing. Then make a 45° miter cut through grooved section. Set saw fence as above to locate cut in relation to end.



3 ASSEMBLE AROUND GLASS, which should be double-strength grade. Bind glass edge all around with friction tape to fit groove snugly. Mount finished sash with screws or hangers.

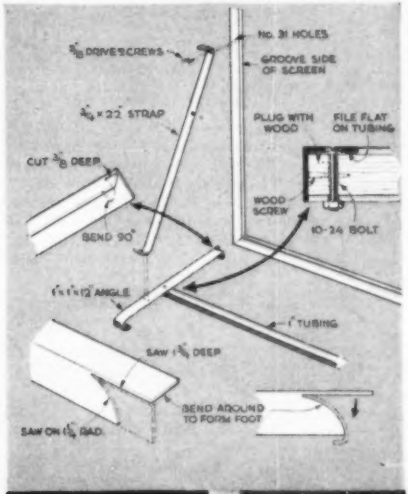
to hold wire.

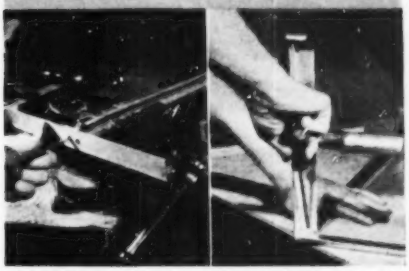


NOW HAMMER IN locking welt firmly. Clip off corner as before and continue around frame. On fourth side, put in only 6″ of wire at time and follow with welt. Sharp knife cuts off surplus.

Aluminum Fire Screen

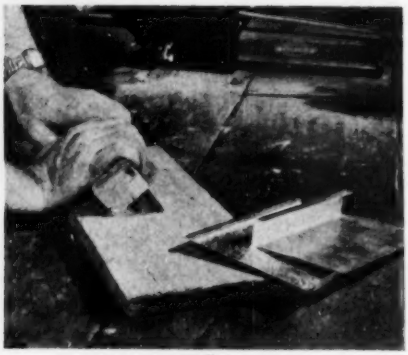
Simply add feet to panel made like window screen.

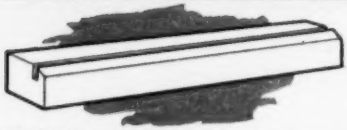




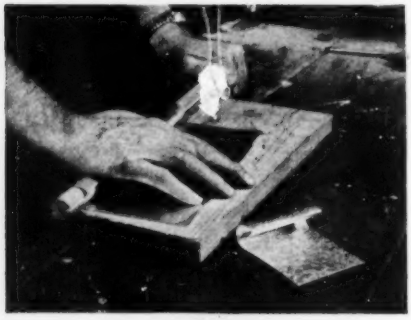
PLUG ENDS of 1″ tubing with wood, file parallel flats, and bolt feet to stretcher. Two wood screws (left above) prevent twist. Attach leg with one screw into panel edge, one into face (right above). Clamp leg and frame at 90° for affixing braces.

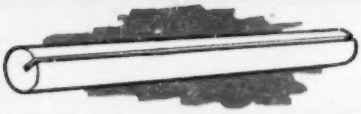
Wood Jigs Shape Edges of Sheet Aluminum





NARROW BENDS, tabs or fold-overs are easy with a piece of hardwood run over the circular saw. Kerf depth governs width of bent flange. Bevel alongside kerf as above. To use, insert stock and fold past desired angle, as metal springs back a bit. For folded edge, bend as far as possible, remove from jig, press down with flat wood.

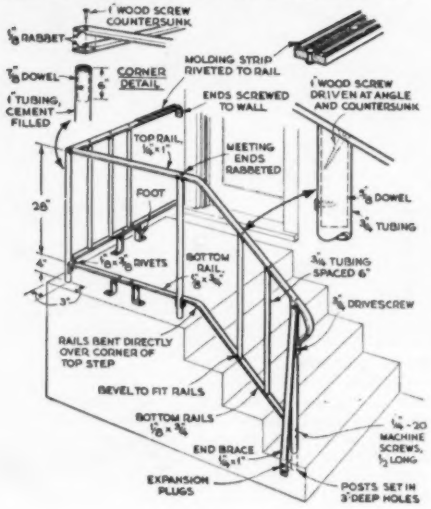


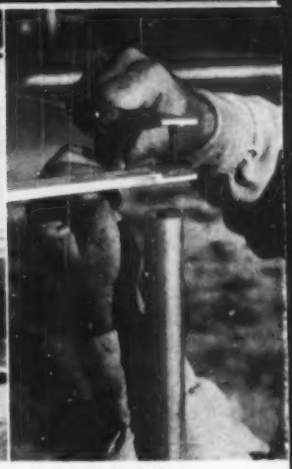


ROLLED EDGE is formed with a wooden dowel slightly smaller in diameter than desired roll. On the circular saw, cut a 3/16"-deep kerf along the dowel. Insert edge of sheet aluminum, and holding it firmly against a flat surface, roll or twist the dowel to wrap the metal around it, being sure to keep dowel straight.

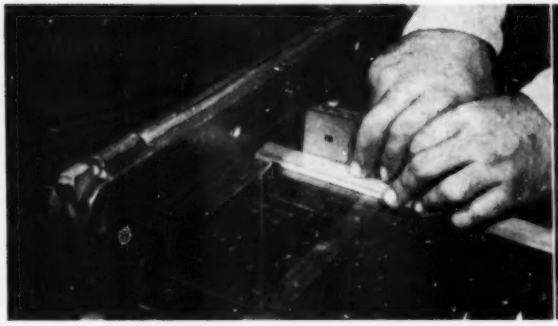
Modern Railing

Here, the light aluminum is put together for a finished job as sturdy as wrought iron.





FILL SUPPORTING POSTS with cement to add strength and eliminate springy feel (left). Use dowel to tamp cement down, leaving top 6" clear for dowel fastening plug. Set posts in 3"-deep holes drilled or chiseled in steps and landing. Plumb each post and brace with wood strips (center) to keep it vertical while you trowel cement around base. Leave braces until cement hardens. Screw top rail on posts, using rabbeted joint (right) to form corner. If steel screws are used, lacquer them to minimize galvanic action that pits aluminum.

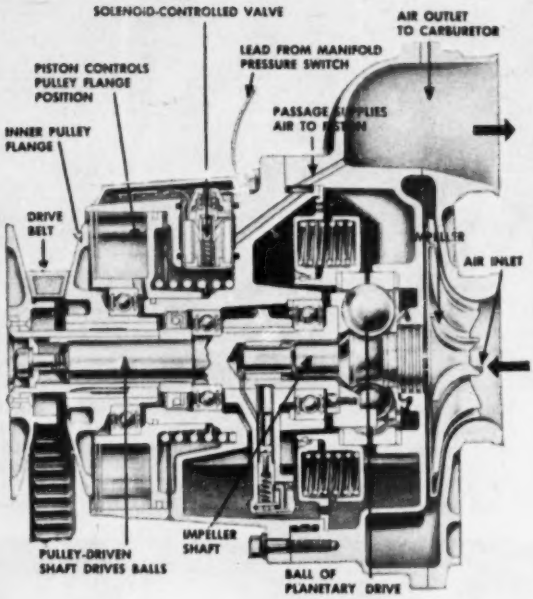


MAKE SERIES OF PASSES over saw blade set to ¼" height to cut rabbet in aluminum bar. Hacksaw will do the job, but not as neatly. Smooth off kerf marks with wood chisel or file.

INSTALL LOWER RAIL between posts. Bend one end, cut to length and fit angle to other end. This eliminates job of making two bends at accurate locations. Fit verticals between rails.

BRACE FOOT OF RAILING with bar attached to side of step with metal expansion plugs set in holes chiseled in concrete. Aluminum machine screw attaches top of bar to railing. Decorative feet, bent from stock used for lower rail, prevent sagging between posts.

RIVET THIN STRIP MOLDING along top rail to conceal the heads of the screws that are used to attach vertical railing members. Miter molding ends at the corner. Use a drivescrew to hold the molding at the curved end of the rail. END



SUPERCHARGER is shown above installed in a Ford. Diagram at right shows how variable drive works. Drive is pictured in high-speed position. When manifold-pressure switch signals for low speed, solenoid opens valve, admitting air to push piston to left. This squeezes inner pulley flange toward its mate, pushing drive belt farther away from center of shaft, driving it more slowly.

New Blower Huffs and Puffs

Said to add 30 percent to a car's power, this new supercharger uses a two-speed drive to give your engine the air it needs.

THERE'S a new supercharger for your auto engine that blows hard when you need it, soft when you don't. An ingenious variable-speed drive does the trick. And thanks to the same device the blower gets the advantage of the low cost and adaptability of the centrifugal compressor without its inefficiency at low speeds.

The new supercharger—the McCulloch VS-57—has two gear ratios for its belt drive off the propeller shaft, giving it two speeds. Which speed is used depends on an electrical signal from a pressure switch in the intake manifold. The pressure there depends on the difference between the overriding pressure of the air-fuel mix rammed in by the supercharger and the vacuum from the suck of the cylinders.

This vacuum is high or low according to whether the engine is working easily or hard. When the load becomes heavy, the change in manifold pressure signals the supercharger to go into high speed to supply the air needed to handle it. When the load drops, another signal sends the device back to low speed. Thus the supercharger runs at its more efficient speed when this is needed, regardless of engine speed.

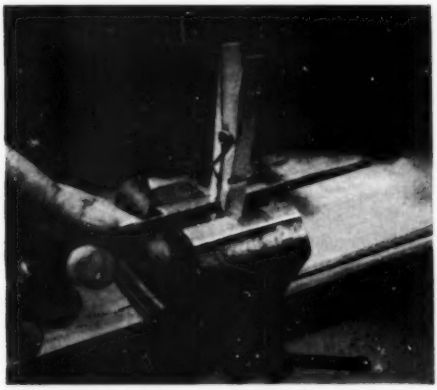
In addition, a governor device keeps the supercharger from running dangerously fast. This shifts it to low speed when the impeller goes faster than 30,000 r.p.m. or the air pressure at the carburetor exceeds five pounds per square inch.

New Blower—New Position

The new blower is installed ahead of the carburetor, instead of between carburetor and intake manifold, partly because of the low hood lines on current cars, partly to make installation easier.

The supercharger pressure is used to maintain fuel pressure by leading a line to the fuel pump. Another unusual feature is the planetary transmission that drives the impeller 4.4 times the speed of the pulley drive. This uses spring-loaded balls instead of gears, cutting noise and wear.

McCulloch Motors, the Los Angeles outfit that makes the new supercharger, says the price for a complete kit starts at $140. Kits will be made for most U. S. cars.

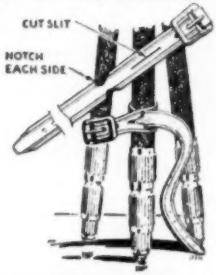


Roughened Pin Jaws Won't Slip

WOOD clothespins will hold better if the gripping surfaces are roughened. You can do this by placing a small round file in the jaws and clamping the pin in a vise. Use just enough pressure to force the file into the wood.—*Ken Murray, Colon, Mich.*

Strap Holds Camera-Tripod Legs

A LEATHER skate strap notched and fitted as shown will keep the legs of a tripod together while it's being carried. Looped around one leg, it won't be lost.—*G. Wagner, Delmar, N. Y.*



Mirror Subs as Light Bulb

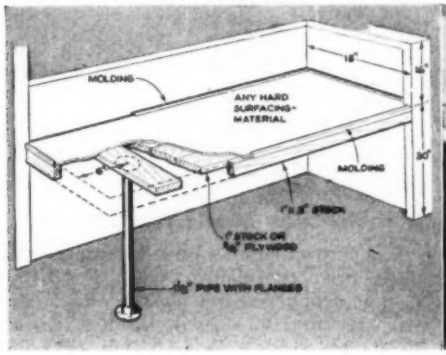
MY DANGLING cellar bulb didn't light up the stoker bin so that I could see to fill it. Now the bulb does—with a mirror. I fastened the mirror to the ceiling and tipped it to reflect light into the bin.—*Hallie H. Holt, Springfield, Ill.*

Typing Marks Ruler in Tenths

TO CALIBRATE a ruler in tenths of an inch, use a typewriter with pica type. Type a series of digits from 1 to 0, then type an apostrophe over each number. Paste the strip of paper on the back of the ruler and cover with clear cellulose tape.—*Harry Nelson Webster, Nutley, N. J.*

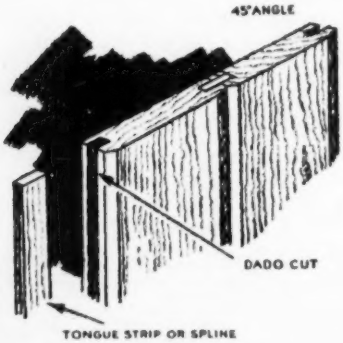
One-Legged Brunch Bar Fits into a Kitchen Corner

BUILT against a low kitchen partition, this neat brunch bar saves space—and steps for the housewife. Construction is merely an 18"-wide top with a cleat to which a floor flange is screwed for the 1½"-pipe leg. Cleats nailed to the wall support the other sides. Hide the exposed edges with an apron of 1"-by-2" stock.—*Hi Sibley, Nuevo, Calif.*



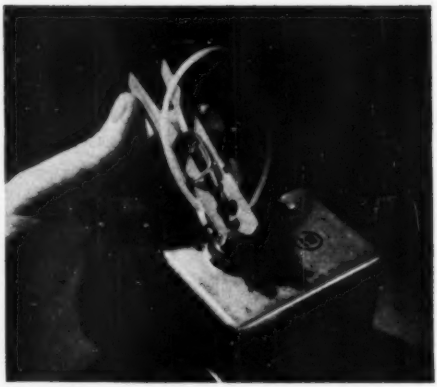
Try This When Painting Walls

A SIMPLE device for keeping paint off the baseboard can be made by tacking weather stripping to the edge of a board about 3′ long and 10″ wide. Let the stripping overhang on one side. Rest the overhang on the top of the baseboard and the bottom edge of the board on the dropcloth.—*E. K. Harden, Cincinnati.*



Tongue Strips Cut Panel Waste

PROBLEM: How to use some white-pine boards with plain edges for paneling without cutting a tongue and sacrificing part of the width. My solution is shown in the drawing above. After chamfering the edges of each piece at a 45° angle on the jointer, I grooved the edges with a dado saw. Then I sawed narrow strips from other material for splines. —*R. S. Wilkes, Keuka Park, N. Y.*



Clothespin Is Electric Clamp

IF YOU lack an alligator clamp for temporary connections in electrical circuits, drill a small hole through one jaw of a wooden clothespin, insert a metal thumbtack and solder a wire to the projecting point. Groove the tack head so it won't slip.—*Ken Murray, Colon, Mich.*

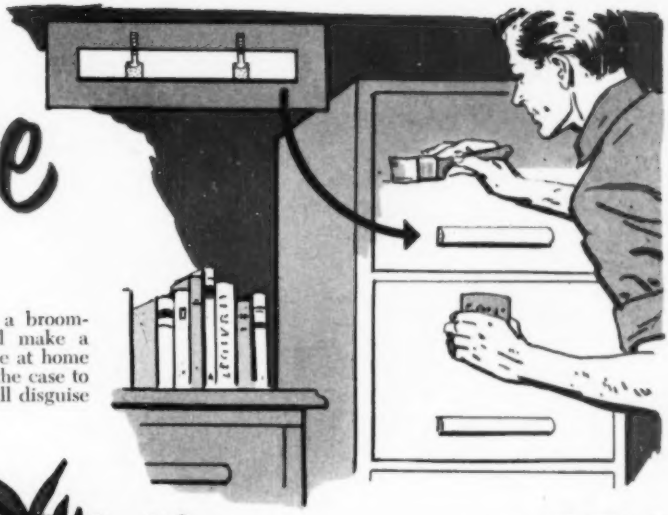
Marking Parts Avoids Mix-Up

EVER take a small electrical part out of its carton—only to find later that the power rating and similar data were thrown out with the wrapper? You can avoid this headache by marking each part with waterproof India ink. Before marking the part, clean the label area with a piece of steel wool.

Screwdriver Made from Wire

A SCREWDRIVER for small jobs can be made from coat-hanger wire. Form the handle with pliers and file the end of the wire on opposite sides to fit the desired screw slot.—*John J. Rea, Urbana, Ill.*

KEEPING THE Home SHIPSHAPE



Drawer pulls cut from a broomstick or dowel rod will make a metal office file look more at home in your home. Painting the case to match other furniture will disguise it still more.

Weight that vase of heavy boughs and it will be less likely to tip. Fishing sinkers or bits of bar solder dropped in the bottom and covered with melted paraffin will help to keep the vase steady.

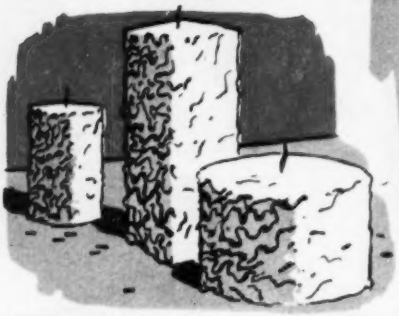
Scrap evergreen that you trim off your Christmas tree when shaping it can be put to good use as decoration for table or door. Just stuff it into a wicker mail basket or beribboned bread pan and glamorize with balls and bows.

To keep a tree green longer, saw off the trunk on a slant. The longer cut will let it take up more water. Keep the butt dunked while the tree is stored, as well as when set up.

A plastic circle cut from one of those transparent boxes in which cheese wedges come packed makes a good temporary lens for a flashlight. Use the broken glass lens as a pattern.

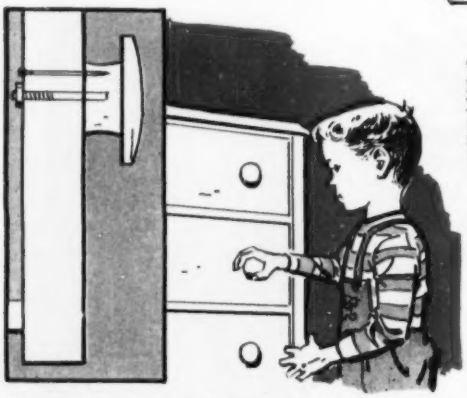
Please turn the page for more home tips.

More Home Tips



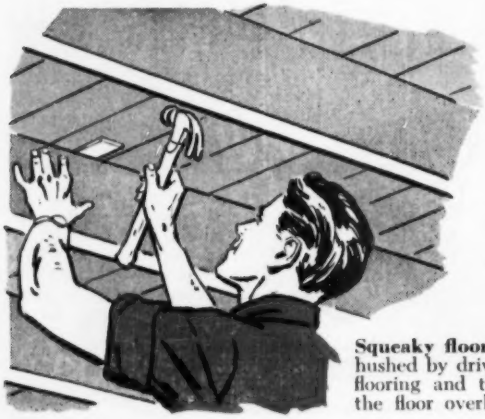
To make frothy-looking candles, melt new paraffin or old candle stubs over boiling water. Then beat the wax while it is still semiliquid.

Christmas cookies can be stamped out with plastic toys to add new and different shapes for youngsters to choose from. Search dime-store counters for hollow toys in designs not found in regular cutters, then separate them down the middle.



To anchor wooden-knob pulls on cabinets and furniture so young children can't spin them off, drive a small finishing nail through the drawer front and into the knob as shown.

To soften putty, run the flame of a small alcohol torch around the glass edges. In cold weather, putty for the new pane can be heated the same way to make it easy to smooth.



Squeaky floors in rooms over a basement can be hushed by driving wood wedges between the subflooring and the joists. A helper walking across the floor overhead will turn up noisy spots.

Unusual Doors Are Easy to Make

Decorated plywood over a core of softwood will add a custom note to your home.

INDIVIDUALLY designed doors for your home can make the difference between that assembly-line look and an air of expensive custom construction. It is surprisingly easy to make the flush type—just a core of inexpensive lumber covered by plywood.

Plywood permits all kinds of decorative tricks. You can even make each side of the door different. The one I made has textured plywood on the exterior to match the house siding and grooved plywood on the interior to match a paneled room.

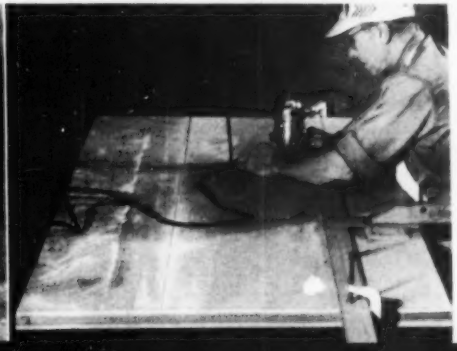
Choose core stock and plywood so that total thickness of the three layers is 1⅜" to 1½" for interior doors, 1½" to 1⅝" for exterior doors. It is best to use exterior-grade plywood and water*proof* glue in outside doors. —*Darrell Huff, Sonoma, Calif.*

CORE starts with mitered frame of softwood sized to opening. Glue and corrugated fasteners hold joints, which need not be unusually strong (plywood face takes care of that).

FIVE CROSS STRIPS are glued into frame. Four are narrow (about 2"); fifth is wider to receive door lock. Place it so that it centers about 44" from bottom of door.

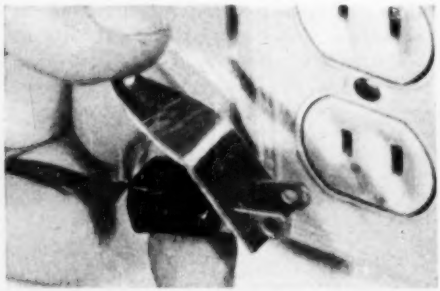
PLYWOOD FACE, trimmed to door size, is nailed and glued to each side of frame. Set nails and fill holes. Door is now finished unless you want to add special decoration.

TO MATCH PANELING of room walls, one face of this door was grooved by routing channels ¼" wide and 1/16" deep at equal intervals. Many other interesting patterns are possible.



New for the Handy Man

1. Pine Paneling Prefinished. Nail up these knotty-pine boards and your paneled wall is completed. The ¾″ boards, textured by blasting and brushing, come already sanded, stained, lacquered, waxed and buffed. They are made with shiplap joints in five colors, 6″ and 8″ widths.

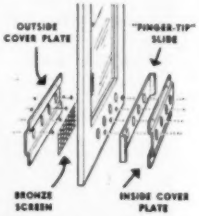


2. Lever Grips Tight Plugs. Appliance plugs that stick tight in wall outlets can be pulled out more easily with the Plug-Lever. A slotted plastic strip, it fits over the prongs to provide a thumb grip.

3. Tube Fixes Loose Wallpaper. If your wallpaper comes loose along the edges, the flexible tip of the Paste-Bak tube gets fresh paste underneath where it's needed. The paste won't spot the paper.

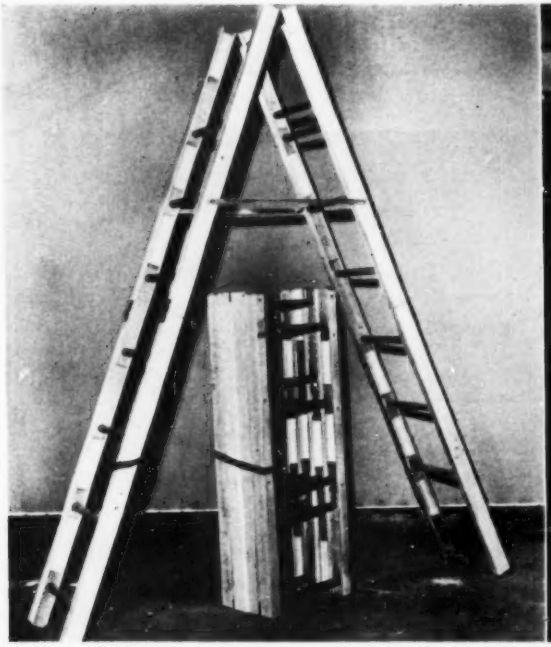
4. Rivets Hammered in. These lightweight rivets are used for decoration or for fastening cloth, leather, paper and plastic. You assemble the rivet through holes in the pieces to be fastened, then flatten it with a hammer. They come in several finishes and sizes, cost 15 cents a card.

5. Vent Attaches to Storm Sash. You can add these aluminum vents to wood or metal storm windows to provide the slight ventilation often needed in winter. The Slide-O-Vent has a sliding door that lets you open the vent holes any desired amount. The holes drilled in the sash are ⅜″ in diameter, the vent is 2″ by 8⅞″.



6. Glass Filters Heated Air. The dust often deposited by gravity warm-air furnaces can now be reduced by simple glass-fiber filters installed under the registers. Glasfloss comes in rolls, is cut to size and fastened to the underside of the register grille.

7. Sandpaper Kit. You no longer need the lore of a cabinetmaker to choose the right sandpaper for refinishing furniture. A new kit contains 3⅝"-by-9" sheets of the eight different types of abrasive needed for such a job—with a booklet explaining how to use them. It sells for less than $1.



8. Ladder Folds. From a bundle less than four feet long, a collapsible ladder unfolds into a 14′ 8″ utility ladder. It can also be used as a seven-foot stepladder (above) or scaffold. The 36-lb., wood-and-aluminum Porta-Fold can support 1,000 lb.

9. Paint Mixer Fits Can. You can leave this mixing paddle in the can while you paint. Its lid covers only half the can and also provides a straight edge for wiping the brush. Called the Prop, it also has a hook for hanging up your brush.

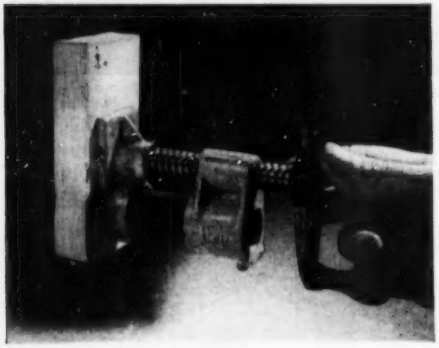
Further information on these products can be obtained from: 1. Ametwood, Box 291, Fort Worth, Tex.; 2. Morgan Products, Box 213, Palo Alto, Calif.; 3. Majestic Gifts Co., Box 1447, Beverly Hills, Calif.; 4. Columbia Fastener Co., 3232 S. Ashland Ave., Chicago; 5. Rene-Craft Products, 22 Owens Building, Wilmette, Ill.; 6. Glasfloss, 155 E. 44th St., NYC 17; 7. Carborundum Co., Niagara Falls, N. Y.; 8. Porta-Fold Co., 525 Alvarado St., Los Angeles; 9. International Allied Industries, Box 202, Hialeah, Fla.

Trouble Light Aims TV Antenna

A TROUBLE light is almost as good as a pair of walkie-talkies when you're trying to aim a TV antenna at the transmitting stations. Extend the light out a window where it can be seen by the man on the roof. The man watching the screen image inside flashes the light fast if the antenna is way off, then slows the flashing to a stop as the correct orientation is reached.—*Arthur R. Tanner, Cold Spring, N. Y.*

Ironed Tape Comes Unstuck

YOU can remove cellulose tape from paper or cardboard without tearing off a layer of the surface with it by first heating the tape with an electric iron. Set the iron at about the temperature for rayon or silk and run it over the tape several times. The heat will temporarily melt the sticky adhesive so that the tape can be peeled off easily. As the tape cools, most of its tackiness will return, enabling you to use it over again several times if necessary.—*Ken Murray, Colon, Mich.*



Can Tops Make Clothes Clips

SIMPLE clips for attaching tags to a coat lapel or other clothing can be made of metal cut from a tin-can top. Snip the top into narrow strips, then punch two deep marks in one end of each strip and one mark in the other end. Folded into a U shape with the punched metal on the inside, each strip can then be quickly clipped to several thicknesses of cloth.

Wood Pads Enlarge Clamps

YOU can make your bar clamps hold larger stock by fastening on wood extension pads like this (left). Each hardwood block is drilled at one end to slip over the pipe and is held to the clamp jaw by two round-head screws.

How I Expanded My Garage

Two cars now fit between the walls where only one used to go.

1. I STARTED WITH THIS one-car garage. First I laid a new foundation for the wall I planned to move. Next I removed doors, sheathing from ends and shingles from roof peak. Then I separated rafters at peak by hacksawing nails.

2. WALL WAS SHIFTED by wedging it up, laying sheets of greased iron plate across old and new foundations and prying it to new location.

3. RAFTERS WERE RAISED to a higher peak by spiking on extensions and new cross-beams were attached to old after wall was anchored. Extra studs were added at ends.

4. I WOUND UP WITH THIS two-car garage. All the old siding was used, plus just enough new to finish. New floor was laid after old footing was knocked out. New door was largest item in $300 materials bill. Counting two friends' help in moving the wall, I estimate the job took 200 hours.—*K. G. Byar, Cincinnati.*

Lamp on Board Keeps Oil Warm for Easier Starting

For cold nights, here's an easy way to keep your engine oil warm. Buy a 150-watt Pyrex-type bulb for outdoor use. On one end of a 48″ board mount a tin can with a porcelain socket inside. The can will hold the bulb upright and help reflect heat. Connect armored cable to socket and attach plug to other end.—*W. Gilman, Middletown Springs, Vt.*

Gus Rides

On a storm-swept Christmas Eve, Gus digs deep into his bag of tricks to save a cargo of holly—and an old man's faith.

By Martin Bunn

WHEN Knute Hansen drove his pickup truck to the pumps at Gus Wilson's Model Garage on that gray afternoon before Christmas Eve, Gus knew where he was bound.

It was near closing time. The sky was brooding and sullen. The very air was thick and heavy. Gus sniffed the weather as he filled the gas tank. Out of the corner of his eye, he studied the old man at the wheel.

Everyone knew Knute. Small, rheumatic, a mere wisp of a man, Knute made a meager living doing odd jobs around town. Christmas time was his chief joy. It was then that he gathered holly, fashioned it into beribboned wreaths and bunches and sold it in the tiny town of Highland, high in the mountains.

Knute enjoyed a monopoly. No one in Highland would think of buying holly from anyone but him. And the holly was free to those who couldn't pay. Knute took an extra measure of pleasure in Highland. His daughter, her husband and three children lived there.

Gus screwed on the gas-tank cap, hung up the hose and walked up to the cab.

with Santa Claus

"Merry Christmas, Knute," he greeted the old man. "Headed for a visit with your daughter, eh? Better take it easy. Weather looks bad."

Knute thrust his head out the window.

"Yah!" he said with satisfaction. "Every year I go home to my Frieda. Maybe this year, Gus, you like to go along?"

Sky Looks Forbidding

"Go along!" Gus exclaimed. "I've got no folks in Highland."

He glanced again at the forbidding sky.

"That's yust it," Knute declared, his faded, blue eyes beaming with friendliness. "I bane vidower, so I go at yule time to my daughter. You bane bachelor man, so you go along with Knute and have one good time for yourself."

"But I've got to be in town tomorrow," reasoned Gus. A chilling gust of wind struck his face.

"That's all right," Knute told him. "You go to Highland with me for Christmas Eve. Tomorrow you drive my truck back. After New Year my daughter and son-in-law bring me back to town."

Gus rubbed a reflective hand over his chin. Knute could get himself in a peck of trouble. But to go on a drive to Highland on a night like this?

"Wait a minute, Knute," he said. "Be right back."

As Gus rang up the state police he thought of the old man, skidding around up in the mountains on dangerous roads, with a storm threatening.

"This is Gus Wilson, down at the Model

Using the tree trunk as a pry, Gus and Knute Hansen finally managed to hoist a rear wheel.

Garage," he said when the state police office answered the phone. "How's the road to Highland?"

"It's open over the pass," the answer came back "but there's no guarantee on how long it'll stay open. There's snow up there already, and more might come at any time."

"Thanks," Gus said as he hung up. It was something over 40 miles to Highland, over a graveled road that was only fair in summer. What the heck, thought Gus. His decision was made. He told his helper, Stan Hicks, where he was going, and left him to close the shop. He climbed in beside Knute, noting that there were chains on the rear wheels of the pickup truck.

"Let's go," he said.

"Sure," Knute declared. "We have one fine time, by yimminy."

They rolled along at a good clip until they branched off into the winding, narrow road that led up into the mountains. The truck labored with its load of holly. Snow began to spit on the windshield and it seemed to Gus that the wind was building up. As they crawled into higher altitudes the vast, brooding hills became blanketed with snow that hadn't reached lower levels. There was six inches on the roadway, fluffing up with new fall. As they topped the summit the truck writhed in the old man's hand as the full force of the gale struck them broadside. It was a wild night for Christmas Eve.

As they moved down after topping the summit, Knute rode the brake pedal too much, not always shifting into lower gears when he should.

Gus Thinks of Taking the Wheel

Darkness was fully down now. It was snowing harder, with a cross wind that drove the storm in gray, slanting sheets across the beam of the headlights. Looking out the window Gus saw a wild, uninhabited land. He thought of taking the wheel from the old fellow, but Knute knew the twisting, up-and-down turnings of this mountain road better than he did.

The oldster was riding his brake as the truck nosed steeply down into a pocket in the mountains. As it hit the bottom, facing a rise, Gus suddenly smelled burning insulation. Almost as the strong scent hit his nostrils, the lights went out and the motor went dead. With one slap of his hand Gus heaved back on the emergency brake. They slid to a halt.

"By yimminy," Knute declared, winding down the window and spitting into the wind, "something goes wrong."

"How right you are, by jimminy, Knute," Gus said, hitting the ground.

Here they were in a dead truck in a night black as the inside of a hat, with six inches of snow on the ground and more coming down by the minute. There would be no traffic over this lonely pass to Highland for days. Highland folks were accustomed to being snowed in at times in midwinter. As far as Gus could figure, they were about 15 miles either way from civilization. Could they walk out? In a blizzard?

Feeling in his coveralls pocket Gus found the ever-present pencil light, pair of pliers, screwdriver, and roll of black tape.

"We should be able to locate the trouble and fix it, Knute," he said with a cheerfulness that was half counterfeit.

"We do," Knute said, and there was deep feeling in his voice, "or I carry my holly over these mountains on my back."

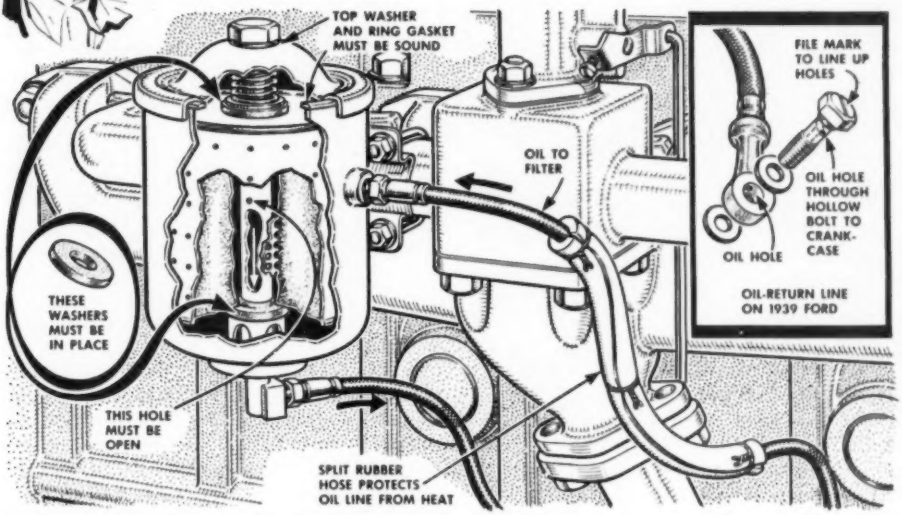
The words halted Gus with the hood half-lifted. He stood there in the blackness and in the wild clamor of the stormy night suffused by a feeling that was greater than his worry. This simple, kindly soul, he observed to himself, is thinking only of carrying holly to Highland.

Gus played his pencil light back and forth over the engine. The light steadied on one of the battery straps. The heavy, leaden connection seemed to have sagged down in the center. Gus reached over and touched it. It was hot. The battery had been subjected to a dead short. It had been so heavy that it had practically melted the lead connecting the cells. The battery was dead.

Gus recalled the burned-insulation smell. He pulled up the floorboards. There was the trouble. The arm of the brake pedal

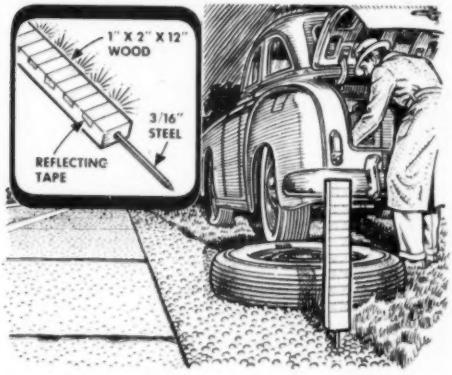
[*Continued on page 238*]

Hints FROM THE MODEL GARAGE

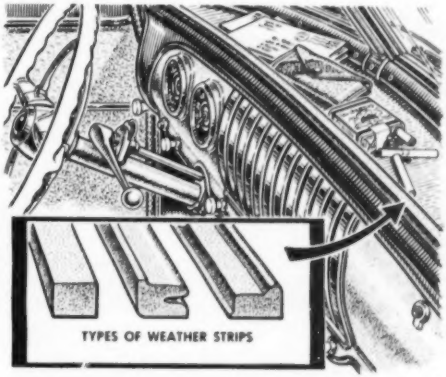


If an oil filter is not working properly you may find the reason or cure here. If the replaceable-cartridge type isn't cleaning the oil, remove the cartridge and make sure the sealing washers, top and bottom, haven't been omitted. Their job is to force oil through the element.

When an element is replaced, the small hole or holes in the hollow tube in the center should be cleaned with a bent hairpin or wire. Clogged holes prevent filtering action. On cars where the oil line passes near the exhaust manifold, heat may weaken and break the line. Protect it with a piece of hose as shown. On some older Fords, oil returns from the filter through a hollow bolt. A mark filed in the bolt head will help line up the holes.



Reflecting tape attached to a piece of wood will give you an inexpensive warning signal for roadside breakdowns. A steel rod will support it.

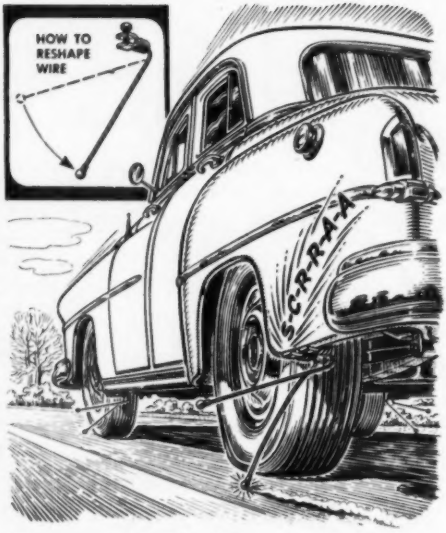


Sponge-rubber weather strip cemented on the flat surface above an instrument panel provides a convenient storage place for maps, matches, cigarettes and other items.

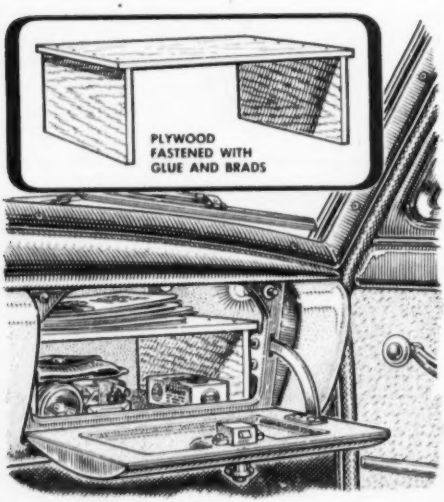
Please turn the page for more auto hints.

MORE Hints from the Model Garage

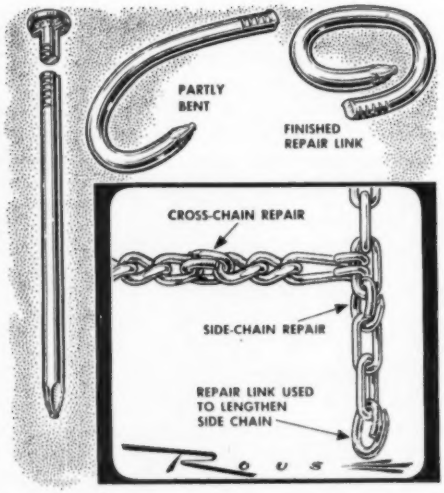
A pair of old tires can be put to use as driveway guides. Since a car can hit them without damage, they can be placed closer to the driveway than other types. Put stones in the buried section of each tire for stability.



To warn of flat tires, install an extra curb-warning whisker. Bend down the end to ride about halfway between the pavement and the rim of the wheel. Then, the noise as the wire scrapes the ground will let you know the tire has gotten soft.



A wood shelf or "bench" built to fit your glove compartment will help keep the contents in order. Leave more space at the bottom than at the top so that bulky objects will have enough room. Maps and other papers will go on the top shelf.



For emergency repair of tire chains, make links from 16-penny nails. Clip off the head and bend the nail as shown, using two pairs of pliers. Leave the opening wide enough so the link can be slipped in place and then bent closed.

ALL MEMBERS OF THE FAMILY are strapped down, youngsters in the rear seat and parents in front, as the Lindsleys set out for a trip. The children like the idea, make believe they're riding in a plane. In addition to a belt across his lap, Pop straps on a shoulder harness for long journeys.

Safety Belts Help You Drive

Strapped down, you're protected if a crash occurs. But that's not the only use for seat belts.

By E. F. Lindsley

DRIVING thrills are for those who like them, not me. Our two cars are just family transportation—to work, to schools, stores and visiting. We roll up about 25,000 miles each year, well over 800 hours in the driver's seat if you figure an average of 30 miles an hour. That's a lot of passing, a lot of quick stops, a lot of the close ones we all see and have in everyday driving.

When I take the kids out in our boat, I insist they wear life jackets. When I crawl to the top of a stepladder, I'm not too proud to ask someone to steady it. I wear

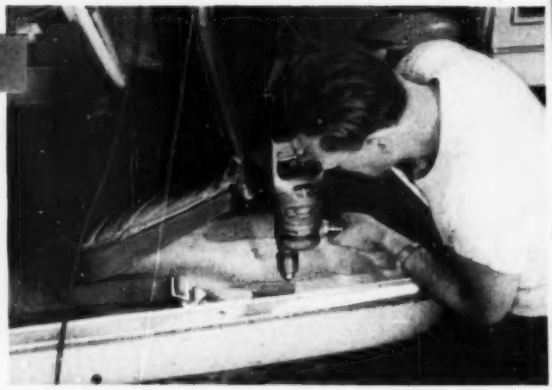
Installing an Aircraft Belt

goggles when I run the workshop grinder, and I carry flares in case my car stalls on the highway at night. I also like my seat belts. If the big brave guys think that's silly, they can go right on doing so.

It has been proved time and again that seat belts pay off in a crash. Every time a Navy pilot sets a hot fighter plane on a carrier deck and fetches up against the arresting gear, he demonstrates that the human body can absorb a sudden stop easily enough —if snugly tied to the machinery instead of smacking around like a bird in a glass cage. The same goes for seat belts in cars.

Driving is easier, too. Most of us never discover until we use a seat belt that it gives the "seat-of-the-pants" feel that fliers rely on. You know instantly what the car is doing. An impending skid, excess speed on a curve, the gentle (at first) hint of a tire going soft, all are communicated to your senses in a way hard to describe but deeply satisfying as a driving experience. Inevitably, this results in better control of the car. Women accused of driving mechanically without really sensing the "feel" of the huge weight under their hands will find that a taut seat belt gives them a feeling of belonging to the car.

The driver is not alone in the added comfort. My wife noticed at once that she didn't have to grab for the handgrip when I took a sharp corner. Another joy for the family driver is seeing the kids stay put.



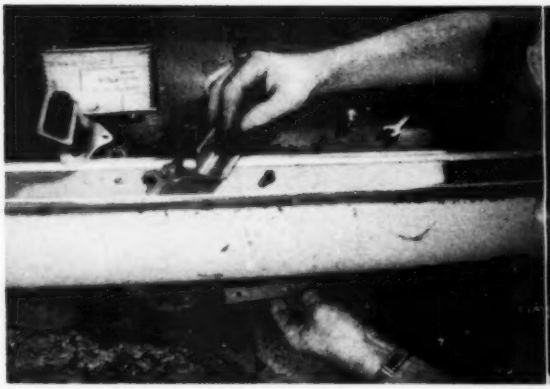
AIRCRAFT BELT can be used in small car or across one section of divided seat in larger one. You could adapt angle-iron anchor that writer used on Crosley to almost any car.

They must be strong. Seat belts may be called on to take a terrific load. For this reason, more than casual thought should be given to the materials used and how you install them. The most economical approach is probably the one I used on my wife's Crosley. Here, by plunking down about $7 at the local airport supply shop, I got a replacement seat belt of approved webbing with a quick-release latch, adjustment clips and terminal connection fittings. Such a belt will easily span the entire seat of a small car. On a conventional-size car, it would do fine for one side of the front seat.

Installing a Kit Belt

SEAT-BELT KITS are available from several makers. Here, the writer is drilling edge of door to anchor belt he put on a Buick. Anchor there keeps door from flying open.

PLATED CLIP placed on door holds belt while not in use. Directions tell where to locate clip, but it's safer to probe with wire to be sure of hitting metal under fabric.



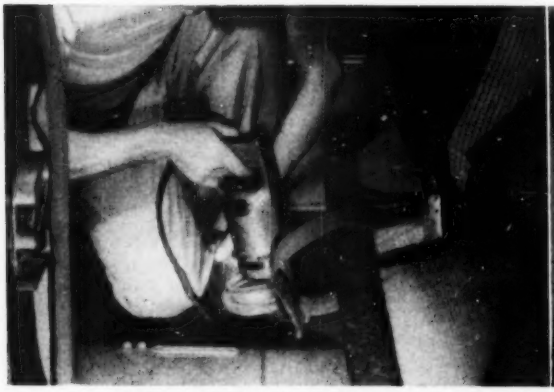
BOLTS with lock nuts or cotter pins are run through bottom panel and 3/8" reinforcing plate to secure anchor. Before drilling, check under floor for gas line or wires.

BELT TERMINAL is aircraft fitting made for the job and secured with best-quality bolt and nut. One belt across both seats is good idea for mother who takes child along.

Anchor points at the floor level and to the rear on each side of the seat seem best for this type of installation. But the thin metal of the body bottom panel usually makes it necessary to use a piece of flat metal to beef up the anchor.

You can buy a kit. Getting around to belts for my Buick, I found that a commercial kit was available to fit. The one I used has an ingenious anchor scheme. By attaching one end of the belt to the lower rear edge of the door you get extra protection against that old bugaboo of the door flying open in an accident. When this happens, the car offers less protection because it loses structural strength. The center anchor for the front seat and the rear anchors at each end of the rear seat are sturdy U bolts with back-up plates. On a four-door car, the rear belts are attached much like those in front. The kit gives instructions and templates for locating the holes you must drill.

A shoulder harness, too. Impressed by the seat belts, I decided to try a shoulder harness on the driver's side. Some authorities claim a harness is all-important for the driver in a severe crash because of the steering column in front of him. I hope I'm never called upon to test the theory. Right now, when I pop into the car to run downtown, I snap on the seat belt and let the harness



CENTER ANCHOR POINT for inner halves of belt is off-center to driver's side. Right-hand belt thus can snug down two persons if three ride in front. Anchor is sturdy U bolt.

BELT FOR REAR SEAT also is held by U bolts and reinforcing steel plate. These anchors should be placed as far to rear as possible. The rear belt extends across entire seat.

Installing Shoulder Harness

SHOULDER HARNESS can be made from old parachute pack. By ripping away the excess, you have two strips of webbing and plenty of fittings for an adjustable harness. No sewing is required. Ripcord housing should be cut off and the padded front clasp used without change. The snaps for leg straps are used for attaching harness to anchor behind seat.

go. Out on the highway on a trip with the speedometer needle swinging toward 65, the harness is on.

Nose around some of the stock-car races and you'll see a variety of harnesses and methods of anchoring.

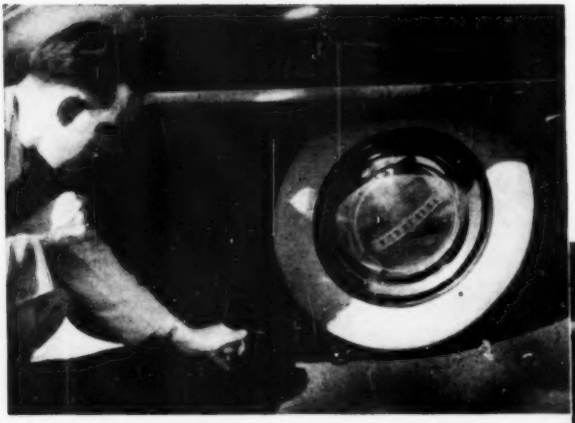
Searching around a few airports brought to light an average back-pack parachute (minus silk) which the owner cheerfully unloaded for a couple of bucks. An hour with a sharp knife unsewing the mess brought me all the soft shoulder webbing I needed, plus a hatful of snaps and tightening keepers. Anyone wanting a shoulder harness should make a quick circuit of the airports and war-surplus stores.

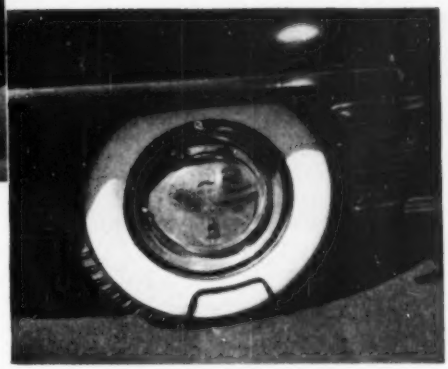
The installation was a snap. Two holes, a husky U bolt centered aft of the driver's seat with both ends of both straps clipped to it and I had a first-rate shoulder harness. I didn't do a thing to the snap and pad that go across the chest except cut off the ripcord housing. The snap slides up or down as you like it and keeps the straps comfortably across your shoulders where they belong.

Disadvantages. The greatest disadvantage of seat belts and a harness is inconvenience. They can't help you if you don't put them on. They help most if they are reasonably snug. When they are snug it's hard to fish your tobacco pouch or wallet out of your hip pocket. If you let them get dusty you may wind up with a stripe across your trousers. Also, the kind of guy that laughs at a drunken driver and smokes while pouring gas in an outboard may needle you about being a scared Willy. But I don't care. Seat belts make sense to me. END

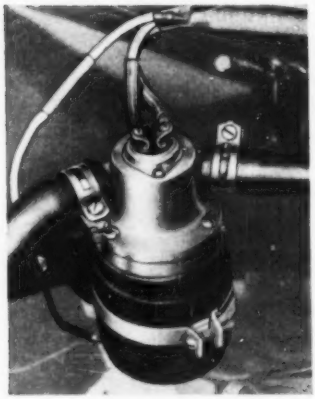
TWO STRAPS run over and under the folding back rest, ends attaching to U bolt in floor. On a four-door car, the fabric at seat fold would have to be pierced for straps.

News from Auto Row

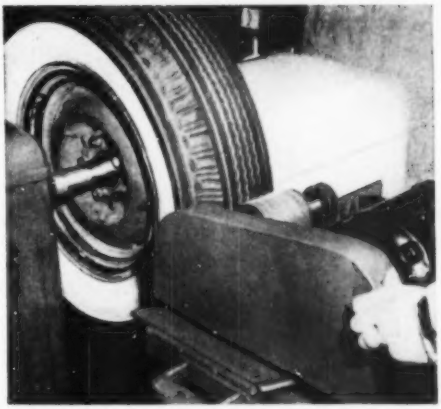




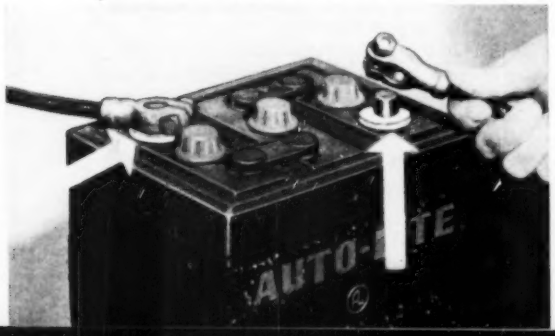
1. Traction Clips Put Themselves On. If you're stuck in snow, you can put on these emergency traction clips without moving the car or jacking it up. The spring-wire clips are pressed against the tire (above), and slight rocking or spinning of the wheels will draw them tightly on (right).



2. Pump Heats Parked Car. You can park your car, stop the engine and still keep warm with this auxiliary electric pump. Connected in the heater's water line, the pump will circulate stored-up heat after the engine is shut off until the water temperature falls below 85° F. Then a thermostatic switch turns the pump off.



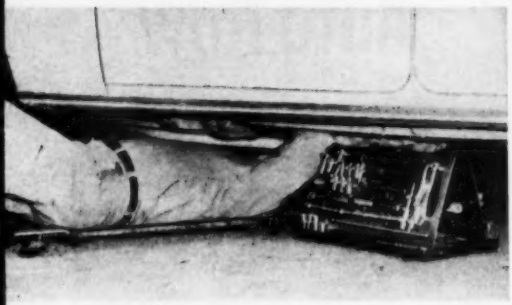
3. Washers to Stop Battery Corrosion. Slipped over the terminals of a car battery, these chemically impregnated washers are said to eliminate corrosion that steals power and shortens battery life. The washers last for about a year. They are color-coded.



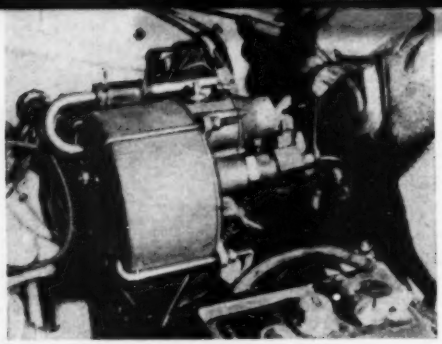
4. Machine Smooths Bumpy Tires. Since no amount of balancing can cure a tire that's slightly out of round, this new machine first makes sure the tire is perfectly true. The wheel is rotated against a gauge that detects high spots, then the bumps are smoothed down with the grinding drum above. The wheel is then balanced on the same machine, enabling all operations to be done in a few minutes without removing and recentering the wheel.

Please turn the page for more News from Auto Row.

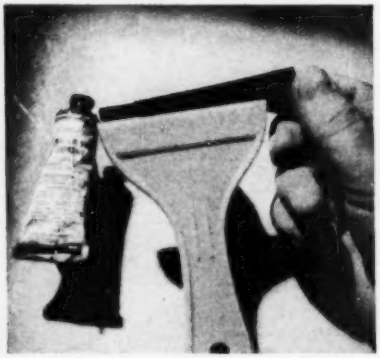
More News from Auto Row



5. Tools Clip to Rack. You can make up any arrangement of tools you want on this clip-on rack and have them within easy reach when working in tight places. The tools are held in spring clips that can be screwed into holes anywhere on the perforated sides of the rack.

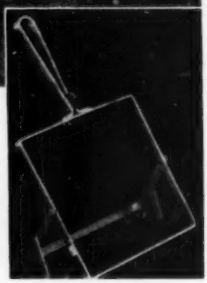


6. Kit Adds Power Brakes. Almost any car made since the war can have power brakes with this accessory kit. It consists of a vacuum-operated booster unit (above) that hooks to the regular hydraulic braking system. Adapters fit most cars.



Ice Scraper Is Squeegee

CEMENT a rubber strip to your plastic windshield scraper. Then after you get the ice off you can turn the blade over and squeegee away the slush. Cut the rubber strip from an old inner tube and cement it with weatherstrip adhesive.—*Ken Murray, Colon, Mich.*



7. Tool Spreads Tire Casing. Steel fingers on this lever-action spreader grip the walls of a tire and force them apart for easy access to the inside of the casing. The tool's frame gives a 10"-square open working area. A safety catch keeps it from accidentally springing closed.

1. Atlas Supply Co., 744 Broad Street, Newark 2, N. J.; 2. Heat Circulator Co., 6917 E. 57th, Seattle 5, Wash.; 3. Racine Specialty Mfg. Co., 1309 State St., Racine, Wis.; 4. Bear Mfg. Co., Rock Island, Ill.; 5. Nutile, Inc., 123 E. Third Street, Joplin, Mo.; 6. Bendix Aviation Corp., South Bend, Ind.; 7. Lummis Mfg. Co., 2242 East Foothill Blvd., Pasadena 8, Calif.

COLLAPSIBLE DRINKING CUP (above) shows principle of interlocking rings that makes a wood disk balloon into a bowl. Rings are jigsawed at angle, coated with glue, then drawn out until wedged (below).

How Lift Sawing Stretches Wood

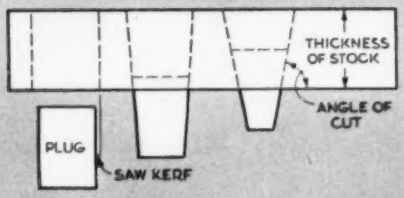
By cutting interlocking rings from a flat board, you can draw them out—like a drinking cup—into many fancy shapes.

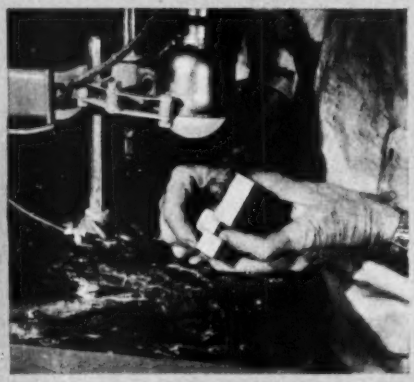
By Edwin M. Love

YOU can change a single flat board into a shapely bowl by sawing it in pieces. Sounds like magic, maybe, but the only trick about it is in the way that you do the cutting.

You jigsaw the board into a series of concentric rings, but instead of cutting vertically, which would let the rings fall through each other, you tilt the saw table so that the blade makes a slanting cut, tapering the edges. Each ring then falls only part way through, wedging itself tightly inside the next-larger one. Draw the rings out and they literally balloon into a rigid,

HOW SAW AND WOOD LET YOU VARY THE LIFTS



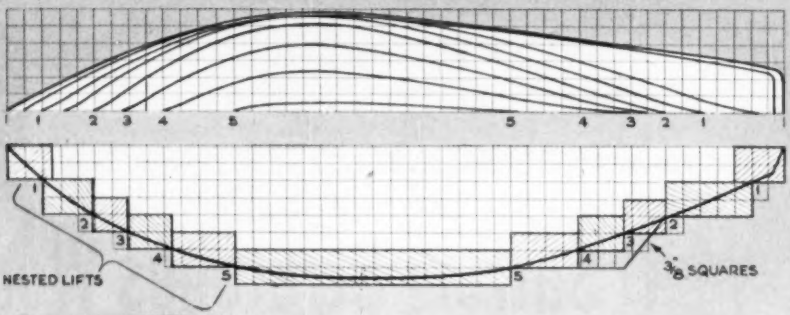


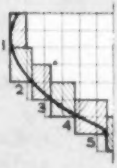
JIGSAWING AT ANGLE produces tapered plug that wedges in tapered hole, projecting part way through (right). Angle of cut, width of kerf and wood thickness determine amount plug (or lift ring) will protrude (sketch). Thin stock is impractical because kerf lets ring fall through, whatever angle of cut. A good thickness is ¾". Trial cuts will show tilt for desired projection—usually half wood's thickness.

three-dimensional object that can have any shape you want to give it.

The technique, called lift sawing, can be used to form bowls, vases, ship hulls, relief maps—any shape that can be built up in tiers. The tiers can then be turned down on a lathe, forming a single, smooth-flowing contour, or left exposed for a stepped effect. Because the rings are all cut from the same board, they save wood. Careful work also assures a perfect matching fit, providing accurate contours. And because they're hollow, they automatically form a hollowed-out shape that saves hours of finishing work.

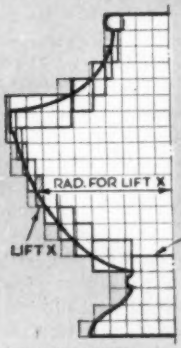
USE LIFT SAWING FOR MODEL-BOAT HULLS

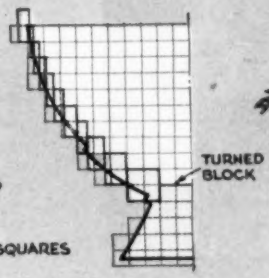




BOAT HULLS are ideal lift projects since rings automatically form lightweight, hollow hulls that need no further chiseling out. Lifts are made as shown in the above plan, which can be scaled up or down to any desired size. Cardboard templates cut to fit various stations along hull will insure accurate shaping of both sides. Use waterproof glue in putting lifts together.

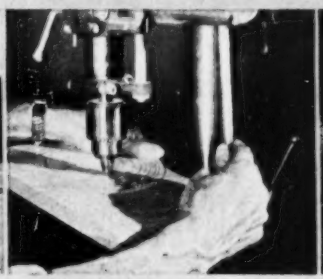
SINGLE BOARDS BALLOON INTO BOWLS AND VASES



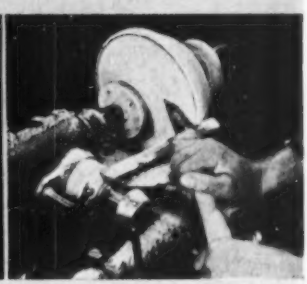


VASE AND BOWL you can make are shown laid out on 3/8" squares. Radiuses for rings are found by measuring distance between centerline and point where the middle of each lift thickness intersects the profile line. Vase needs one set of lifts for body, another for neck. At right, finished vase has drinking glass that fits inside neck to hold flowers.

CIRCLES ARE LAID OUT with compass after radiuses of rings have been determined from scaled profile. Radius line, intersecting circles, provides register points so rings can later be assembled in same positions they were sawed.



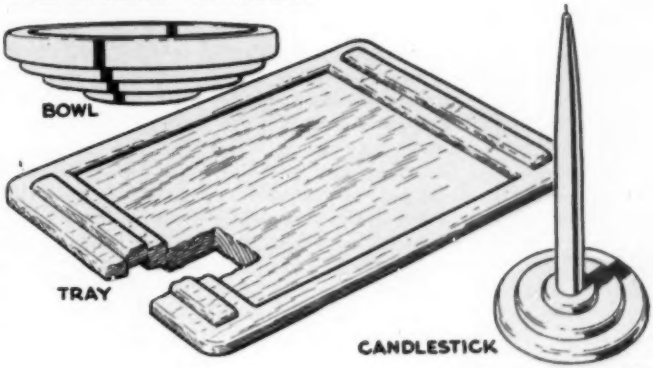
DRILL STARTING HOLES for jigsaw blade at same angle as for sawing. Make several holes in row, then punch out waste with knife to form slot for wide saber blade. Small nail clipped off square makes handy drill that won't drift.



VASE IS TURNED at slow speed, using lift joints as guides for shaping contours. Remove waste down to each glue line and desired shape will result. Solid top lift engages lathe, is cut out later.

STEPPED PROJECTS ARE EASIEST TO MAKE

STEPPED PROJECTS like this bowl and candlestick are easy to make by simply allowing lifts to remain exposed instead of turning them down on lathe. Tray has a double, reversed lift—bottom is recessed while endpieces are raised to make handholds underneath. Edges of all lifts should be slightly rounded and sanded smooth. END



Box-Camera Wizard Snaps Famous People

John J. Loughlin won't touch anything more complicated than a flash Brownie —but his pictures rival the pros'.

By Dave Stanley

SOME of the nation's most professional-looking flash pictures are being taken today by a mild-mannered amateur photographer who gets extraordinarily fine results with an ordinary box camera. His name is John J. Loughlin, and with his trusty one-bulb flash and an inexpensive $11.95 Brownie he's won the gold-spangled accolades of the photography world. His two-and-a-half-room apartment in Manhattan is as crowded as a well-stocked camera store with prizes, citations, merit awards and mementos of exhibitions.

Loughlin revels in his camera equipment. Since the day almost 30 years ago when he bought a one-buck box in Troy, N. Y., his only concession to change was in 1946 when he discovered flash. Then he bought himself another box camera with flash synchronization. Now he's surprising the experts with striking candids, night outdoor shots, and "at home" scenes. Particularly outstanding are his portraits of celebrities, including Presidents of the United States, top scientists, Pulitzer Prize winners, sports idols, diplomats, Broadway and TV stars—all shot on the run.

Loughlin is one of the hundreds of thousands of home-loving hobbyists whose hearts have been captured by the tiny flash bulbs. Once almost the exclusive tool of news photographers who wanted to capture spot news, today they are used everywhere. Reason? "Flash is sunlight at your beck and call. You can shoot indoors without expensive and bulky equipment," says Loughlin. "And without pushing the furniture. You just click the clicker and that's all."

The New York box-camera enthusiast swears by flash, which has revolutionized photography as 3-D has Hollywood. Flash was introduced in 1930, but sold poorly. Today, according to U. S. Department of Commerce figures, photoflash-bulb production is a whopping big business with more than 339,000,000 units (worth 49 million dollars) produced in 1952. Not only that, flash-designed cameras are leading the popularity polls. Sixteen million were sold in 1952—more than 85 percent of all cameras sold that year. Eastman Kodak recently announced: "Practically all cameras produced by us at the present time are designed for use with flash."

No, Mr. Loughlin is not alone. But what's his special camera magic? You might say

Here Are Some of Loughlin's Celebrities

HOW MANY DO YOU KNOW?

(See their names at the bottom of the page.)

Answers 1. General of the Army Omar Bradley; 2. New York City's Mayor Vincent R. Impellitteri; 3. Champion Golfer Ben Hogan; 4. Post-Mutation Carl Sandburg; 5. Moose-TV Star Jimmy Durante; 6. President Dwight D. Eisenhower.

that he knows the capabilities of flash, the reaction of flash to different lights, shadows and textures. But he says simply: "Seven years of practice."

Take the national pastime: shooting babies with flash. Loughlin clucks sadly at the way many photographers make the mistake of shooting babies dressed in white. "When flash hits all that white," he says, "you get distortion and you lose the baby's features. Best thing to do is to use color in the baby's dress and blankets. This brings forward the baby's features."

On dog pictures, he warns: "Shooting a good portrait of your favorite dog requires a lot of care. No matter how much the dog loves you, chances are that he'll let you take only one flash picture. So make your first picture count."

A dazzling array of flash techniques—multiple flash, flash with extension cord, flash as back light—have been developed. Loughlin takes the unorthodox, simplest, low-cost road. He shoots with one bulb (Press 40) atop his box camera. That's all. Not finicky, he shoots his celebrity portraits very quickly. "I shoot and am away while most of the photographers are still fussing around."

Celebrities Are His Specialty

When the box-camera enthusiast is on the trail of a celebrity, he is as relentless as a Georgia police dog. He uses the phone, letters, intermediaries—even surprise. He's caught President Eisenhower at a private New York dinner, Adlai Stevenson in the lobby of the Hotel Roosevelt, Ben Hogan at a bulb-popping press conference at the U.S. Golf Assn., Pearl Buck in her car, Supreme Court Justice William O. Douglas outside New York's Community Church, Harold Lloyd on the ramp of the Hotel Commodore, Mme. Pandit of India at a party at the Waldorf-Astoria, and Bernard Baruch—where else?—on a bench one Sunday morning in Central Park.

The FBI even helped him get one of his best pictures, a portrait of Jimmy Durante. Through a friend he ambushed Durante, who was entertaining at a private FBI dinner. Loughlin got a wonderful shot of Durante's mug, but the portrait got as much circulation as a lie detector at a liars' convention. The picture got onto the front page of probably the world's most secretive house organ, the G men's own *Grape-Vine*.

They Autograph in Advance

Loughlin is always on the alert to add to his portrait collection, which now numbers 72. Not long ago, he got wind that Carl Sandburg, the Pulitzer Prize-winning biographer of Lincoln, would be in New York. He was especially interested in shooting Sandburg, for Loughlin has a fine collection of photographic Lincolniana. After much phoning, he finally got to Sandburg at his publishers' offices. "I took one picture of Mr. Sandburg at a desk, and another of him looking at one of my Lincoln photographs, and in two minutes I was out," Loughlin recalled. One of Loughlin's best portraits, it caught the author's peculiar down-the-middle part, the short cowlick.

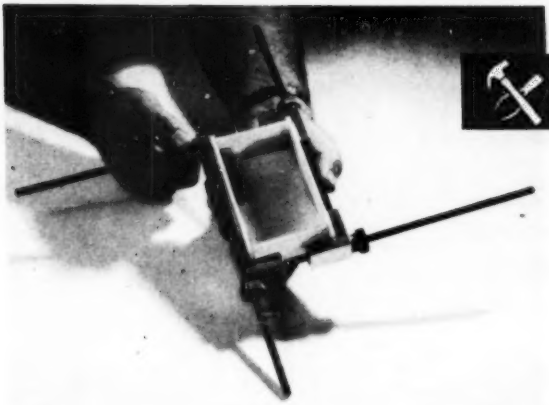
The "Wizard of the Box Camera"—as he was once tagged at a show—gets the celebrities to autograph the portraits with a neat trick. "When I'm going to take a picture, I carry along an empty picture mounting, and they sign on the bottom."

Though an unpaid press agent for the box camera, Loughlin is not blind to its limitations. "You can't shoot fast action because of the box camera's shutter speed of 1/25 or 1/50 second," he says.

"One of my best shots made with flash and box camera was taken outside Child's about seven o'clock in the evening. There was a girl doing a chef-in-the-window thing, making flapjacks. Well, I studied her for a while and watched her toss them in the air. I figured out the exact point when her arm started to come up. Then I shot, and got a wonderful picture of her flipping the golden brown flapjacks in mid-air! I shot the picture, of course, through the window. What a shot! I still get hungry every time I look at it."

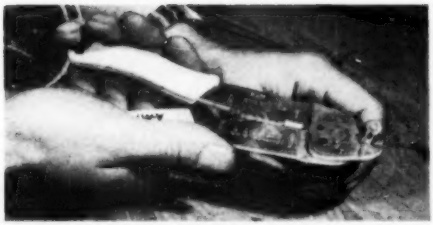
Workshop Wisdom

I'll climb down much faster, thought Hadder
By facing away from the ladder.
He thought he was hep,
But one foot missed a step
And he landed ahead of his shadder.

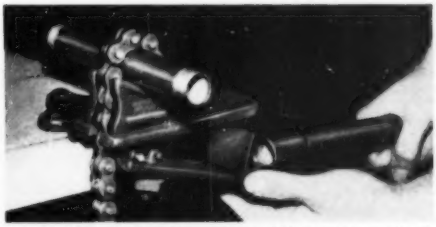


New Tools

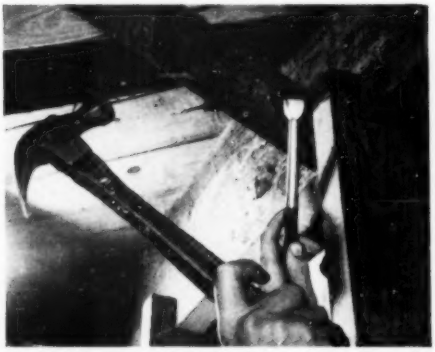
1. Threaded Rods Clamp Frames. Entire frames or boxes can be clamped square in this four-cornered gluing rig. Aluminum corner blocks are drawn up tight by thumb nuts on long threaded rods. Holes in the blocks permit nailing. Four sizes give maximum openings of 8″, 12″, 18″ and 24″.



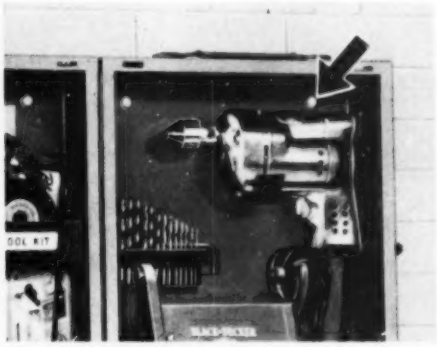
2. Pliers Do Four Jobs. The tips of these wireworking pliers crimp solderless lugs on wire with a single squeeze (above). Behind the tips are five threaded holes into which machine screws can be turned, then sheared off without damage to the threads. Along the handle are a wire cutter and six slots for stripping insulation.



3. Ratchet Locks Pipe Vise. You don't have to tighten any screws in setting up this chain-type pipe vise. Once the handle has pulled the chain tight, a sliding ratchet is simply slid along the handle until it wedges it down, locking the chain. Two models are available, one for pipe up to 2½″, the other for sizes to 4″.



4. Holder Speeds Nailing. You hit the nail and not your fingers with this holder. It has a grooved magnet at the tip. The holder alone is a tack hammer.



5. Drill Kit Hangs Up. Just knock out removable inserts in the back of this drill kit and you can hang the entire metal cabinet on the workshop wall.

Further information can be obtained from: 1. Cincinnati Tool Co., Cincinnati; 2. Aircraft Machine Products, Harrisburg, Pa.; 3. Springlood Mfg. Corp., 9 S. Clinton, Chicago; 4. Hunter Tool Co., Box 7395, Lago Station, Los Angeles; 5. Black & Decker Mfg. Co., Towson, Md.

Two Work Supports for Your Power Saw

One has wood rollers, the other ball bearings to carry the stock. Build the one of your choice.

WHEN you're sawing unwieldy stock, outboard work supports are better than people. They won't ever tire, move the work unexpectedly, or leave when most needed.

Roller stand. The husky support on the facing page will handle long planks, wide boards or plywood panels with equal ease. The rollers can be gang-turned on a wood lathe. Centerdrill them 5/16". Sand 5/16" dowel to an easy fit in the holes, cut 2¼" pieces, and dip in hot paraffin.

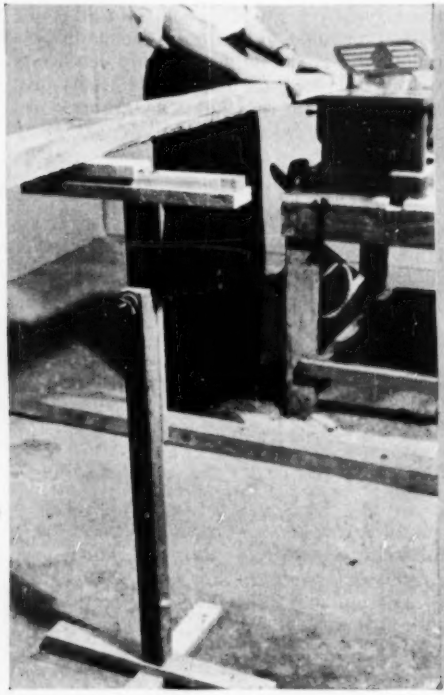
Tack the four rails together and drill holes (a tight fit for the dowels) through all of them at once. Pull the rails apart and assemble with the legs as spacers, cutting these ½" shorter than the height of your saw table above the floor. Screw iron angle braces inside the stretcher and end blocks.—*Stanley Roberts, Los Angeles.*

Ball-bearing support. Useful chiefly for crosscutting, the stand below will enable you to square long, heavy boards easily.

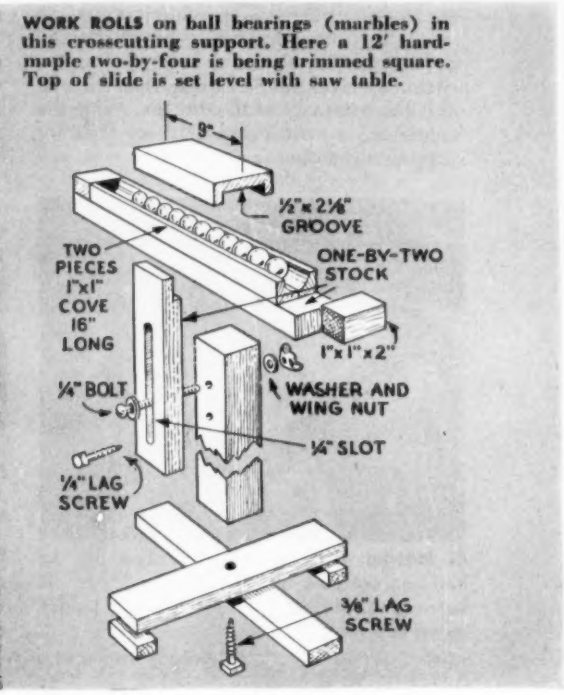
The work rolls on ⅝" glass marbles that serve as ball bearings. These are placed in a trough made of standard cove molding. Tack two lengths to an 18" one-by-two and close the trough with a block at each end.

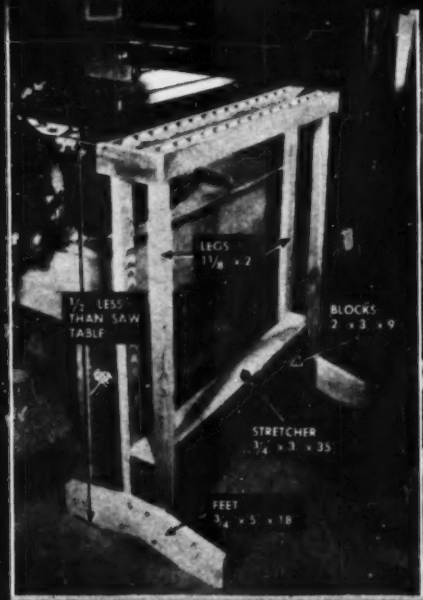
Cut a smooth-bottomed groove in a 9" piece of one-by-three to make the slide, or build it up by nailing two pieces to a third. Use 12 to 15 marbles of uniform size.

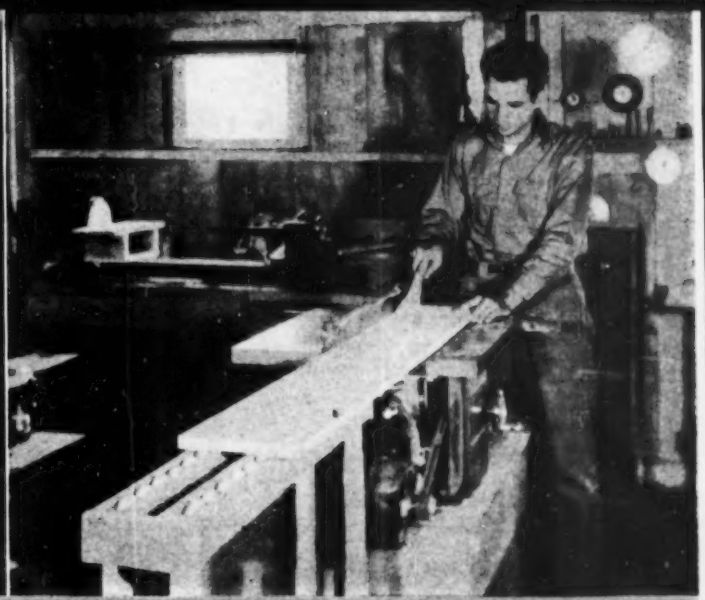
Make the base upright 8" shorter than saw-table height. A small lag screw below the clamping bolt prevents the head from turning.—*Frank M. Butrick Jr., Alma, Mich.*

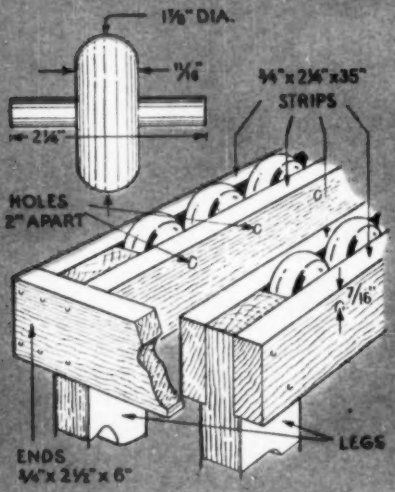


WORK ROLLS on ball bearings (marbles) in this crosscutting support. Here a 12' hard-maple two-by-four is being trimmed square. Top of slide is set level with saw table.



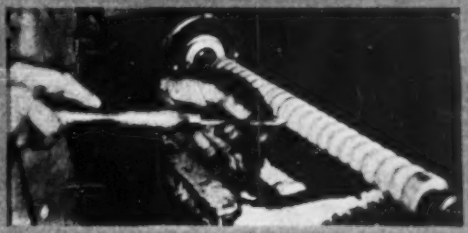






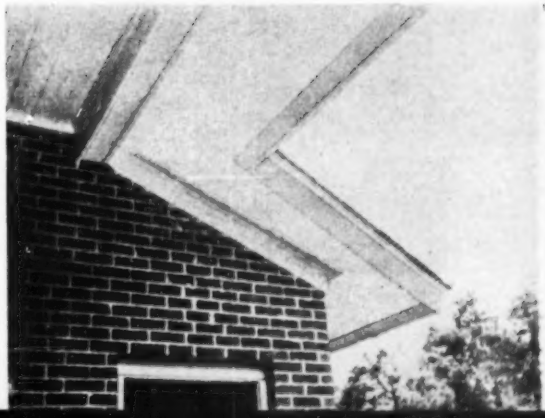
ROLLERS SUPPORT STOCK its full length for ripping. With the stand located directly behind the saw table, overhanging work rolls smoothly and has no tendency to tilt or slide away from the fence.

TURN DOWN 2" oak or maple 1 7/8" diameter, mark at 3/4" intervals and turn all the rollers at once. Saw apart to 13/16" thickness. Mount a scrap block on lathe faceplate. Bore to a push fit for rollers. Insert each and run through a 5/16" drill held in the tailstock chuck.



Eaves Ventilate Roof

A QUICK-AND-EASY way to provide under-eaves vents—needed in many homes to cool the roof or prevent condensation—was worked out by J. D. Johnson, Tallahassee, Fla., contractor. He stapled screening directly to the framing and then simply covered the screening with perforated panels of 1/8" Peg-Board Masonite. This takes less time, he reports, than setting in the usual framed-screen vents.



Push Button Controls Toy Train and Stops It Automatically

HERE's an easy way to make sure small fry don't dash off leaving an electric train running. Connect an ordinary push button in series with the feeder wire to the track. It not only saves current and wear and tear on the trains, but prevents a dangerous short from going unnoticed in an unattended closed circuit.

Several buttons in parallel will provide controls at different points around the track. *—Karl Greif, Vestal, N. Y.*

Hinge Pin Flares Tubing

A BALL-END hinge pin borrowed from a house door serves nicely when you have to flare the ends of a few pieces of copper tubing. Clamp the tubing in vise-grip pliers, place the pliers over the open jaws of a bench vise and tap the ball end of the hinge pin into the end of the piece of tubing.*—Albert P. Zanelli, Tampa, Fla.*

in DECEMBER for ice

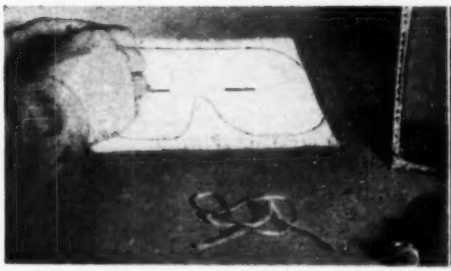
and sleet. Ice and sleet are just as likely to cause accidents in the South, where their occurrence is rare and people are not accustomed to them, as in the North.

NORTH OR SOUTH, the person who survives is the one who notices and is prepared to meet winter conditions. Try to clean the snow off walks and steps before the snow freezes to the surface or turns to ice. Put sand, ashes or salt on ice. **Be sure to watch your step. If icicles form on your roof overhang, knock them off before they get big enough to fall and hurt passersby. When driving, keep your windshield clear, use chains or snow tires, and stay well behind the car ahead. Always remember to turn into a skid. Brake by pumping the pedal. But most important of all in driving: go slow.**

How to Make a Snow Mask

Using a trick borrowed from the Eskimos, you can quickly cut a cardboard eye shield.

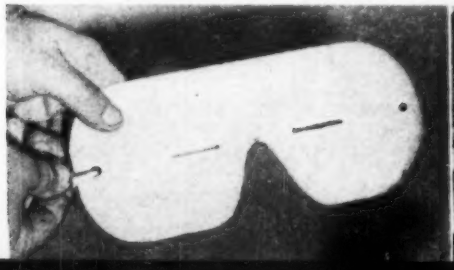
IF YOU engage in winter sports that leave you exposed to sunlight on snow or ice for long periods—beware of sun glare. Your eyes may be damaged if they are not protected. This emergency eye mask, an idea borrowed from the Eskimos, can be quickly made from a piece of cardboard. Narrow slits block out dangerous light rays coming from below.



1 CUT A 10"-BY-4" PIECE of fairly pliable cardboard. Draw mask outline, making nose channel a bit shallow so that it can be trimmed to bring eye slits into position.

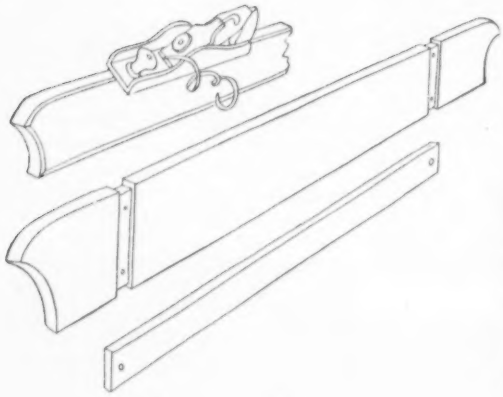
2 A HUNTING KNIFE is excellent for cutting out the mask. Try to work on something flat, especially for the slits. Make these about 1/16" wide and as long as your eye.

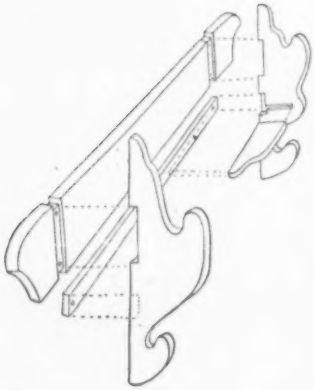
3 PUNCH HOLES at each end of the mask. Through one hole tie a piece of string long enough to go around your head so that it can be fastened at other end for a snug fit.

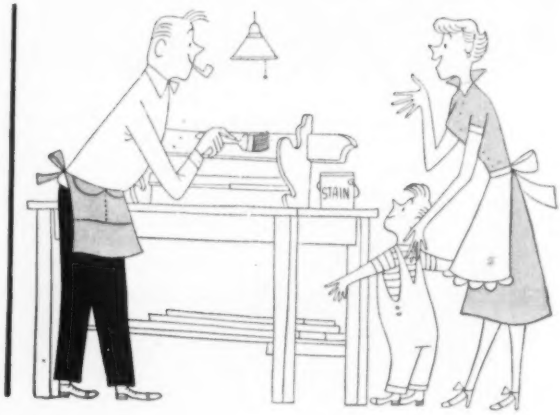


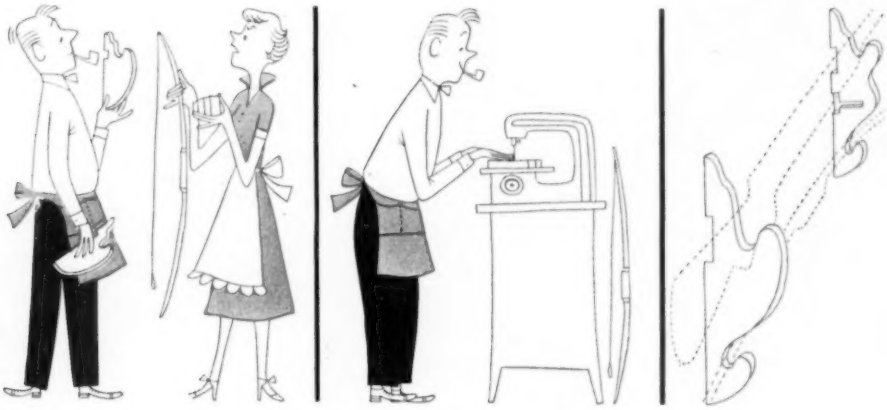
4 DARKEN THE INSIDE around the slits. A pencil, piece of charcoal or burned stick will do the job. This prevents light from bouncing from cardboard back into eyes.

Wordless Workshop





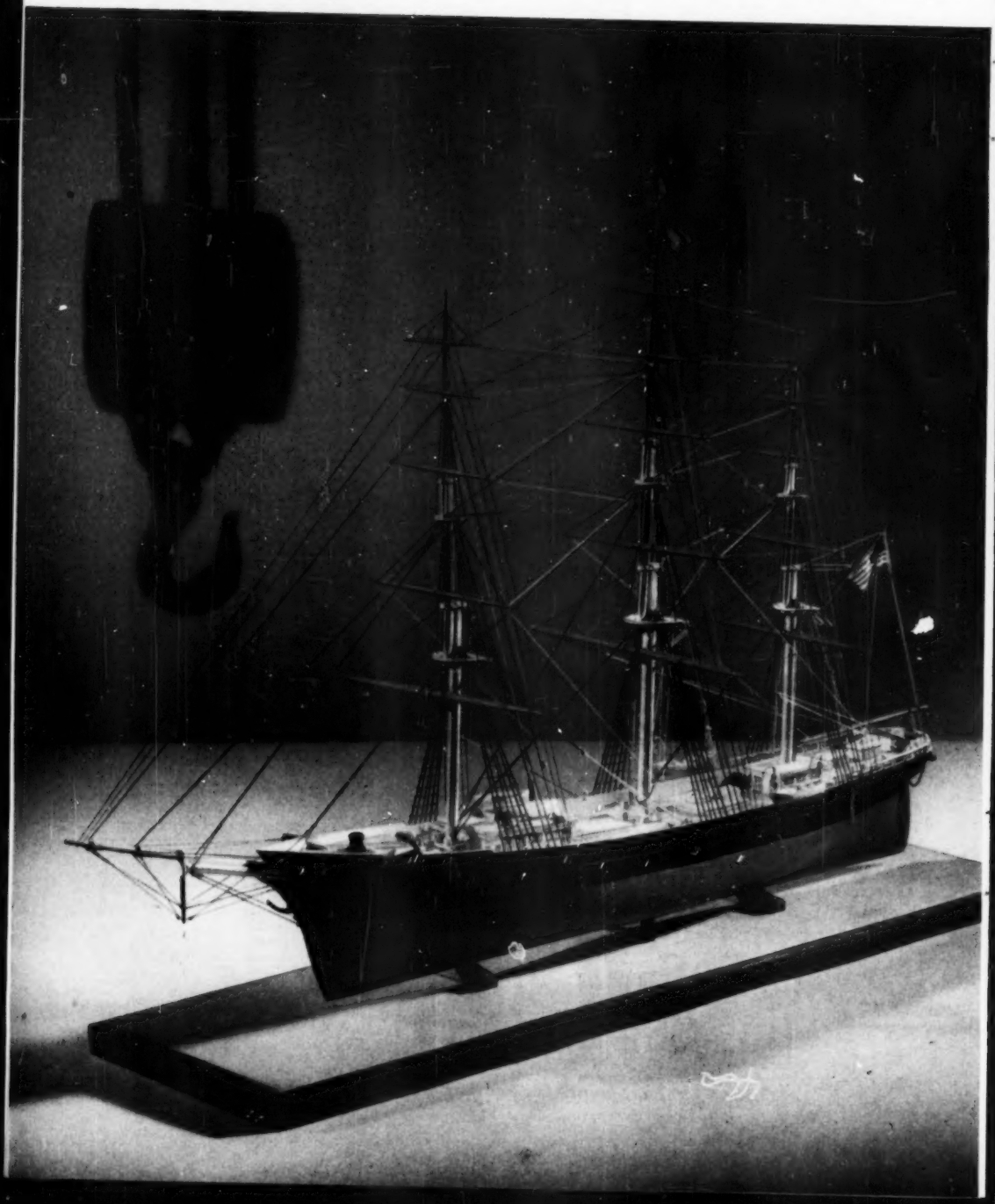




See PSM next month for another Wordless Workshop.

How to Build the

By Winthrop Pratt Jr.



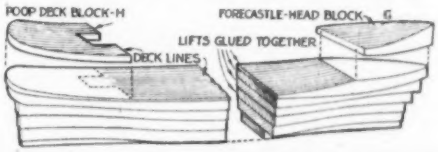
World's Fastest Clipper Ship

Famous plans by a master modelmaker show you the easy, step-by-step construction of this fascinating model.

A HUNDRED years ago, the world's fastest clipper ship, *Sovereign of the Seas*, dashed out of Honolulu, bound homeward to New York on a breath-taking journey that was to set a new speed record for sailing ships. On one stretch of that voyage, she raced 3,562 miles in just 11 days. No sailing ship has since equaled that record, and none now ever will.

You can build a scale model of this ship that will be a family treasure for the next 100 years. The project calls for a scale of 1/12" to the foot, converting the *Sovereign's* 318' from bowsprit to stern rail into a gleaming 26½" miniature. The plans shown here are one-third actual size. All dimensions can be obtained by simply measuring the plans and multiplying by three. For the templates and hull contours, you can either have the plans enlarged photographically or scale them up yourself on squared paper. In either case, the full-size plans are then traced directly onto the wood, using typewriting carbon paper, to give you the outlines for sawing.

Building up the hull. To speed construction, the hull is left solid. It consists of six layers or "lifts" of pine, each 3½" wide, 20" long and 5/12" thick, built up like a sandwich as shown below. Since the 5/12" dimension is the usual thickness of ordinary planed ½" stock, you have only to



buy the pieces, trace on the proper contour for each lift, and jigsaw the parts to shape. Then, starting with lift F, turned upside down, glue on each succeeding lift, aligning them carefully and inserting small brads to keep the layers from shifting when you apply the clamps.

When the glue is dry, it's time to cut the deck curve, called the sheer, that runs from forecastle to stern. Use a flat chisel or spokeshave, at the same time shaping in a slight camber or downward curve from the center line to the sides. Sand the deck smooth and pencil in the planking lines—10 to the inch.

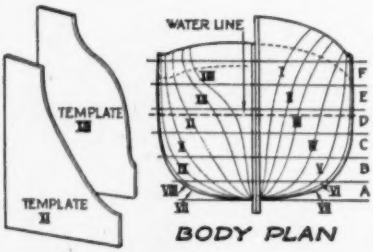
The forecastle and poop blocks are glued

MEN who have been reading* POPULAR SCIENCE MONTHLY *for 30 years or more fondly recall the late Capt. E. Armitage McCann's articles on model-ship building. One of today's outstanding builders of model ships is Winthrop Pratt Jr. of Dorchester, Mass. This past summer, Mr. Pratt built a model of one of the world's most famous ships. To do so, he used the plans published in* POPULAR SCIENCE MONTHLY *in 1926 by Captain McCann. The issues in which Captain McCann's articles first appeared are now out of print. But many enthusiasts still consult them in libraries which have bound volumes of this magazine. For the benefit of others who do not have access to the original work, the editors asked Mr. Pratt to prepare this article. The plans shown are those of Captain McCann; the photographs are the work of Mr. Pratt.

on next. The forecastle block is ¾″ thick at the bow, ¼″ thick at its aft end. The poop block is cut out to receive the cabin house and overhangs at the stern.

Shaping the contours. You're now ready to cut the crusts off your sandwich, shaping it down to the sleek hull lines that sent the *Sovereign* smashing one speed record after another.

From the body plan below, shown one-third actual size, scale up a full-size drawing and cut out 13 templates, transferring their outlines to stiff cardboard with carbon paper. These templates show the hull contour at each corresponding station marked on the full-length sheer plan.

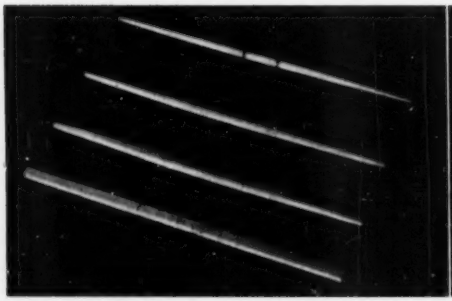


BODY PLAN

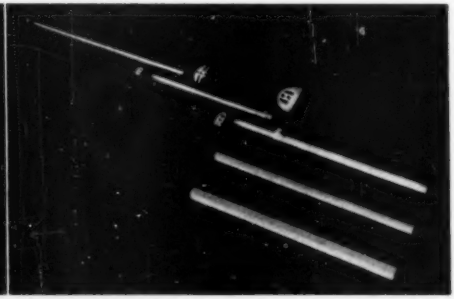
Pad the jaws of your vise to protect the wood and clamp in the hull on its side. With a curved chisel, spokeshave or half-round rasp, gradually shave away the excess wood, trying the templates frequently, until the curve of the hull exactly matches the template at each station. Start at the midship line and work toward each end, then turn the hull over and shape the other side in the same way. Trim the bow and stern to fit the ¼″-thick stempost and sternpost and sand the entire hull smooth.

Adding hull detail. The bulwarks are 3/32″ pine, ¾″ wide and 13″ long. Cut rabbets 3/32″ deep and 3/16″ down from the deck line, as shown in the sketch, and glue and nail the pieces in place.

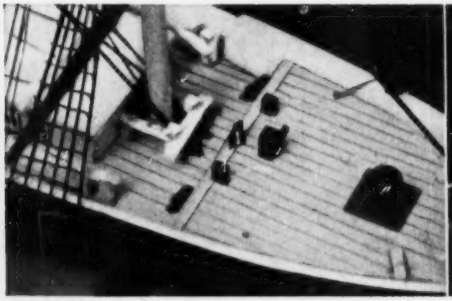
[*Continued on page 232*]



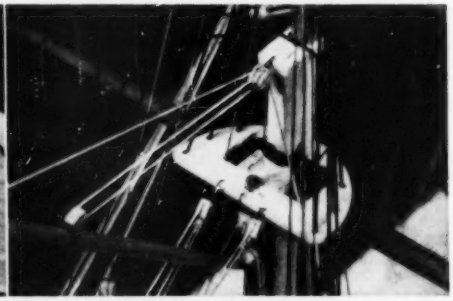
MAKING A YARD. Stock is first split out to insure straight grain, squared up and tapered at ends. Then piece is planed to eight-sided shape and finally sanded round and smooth.



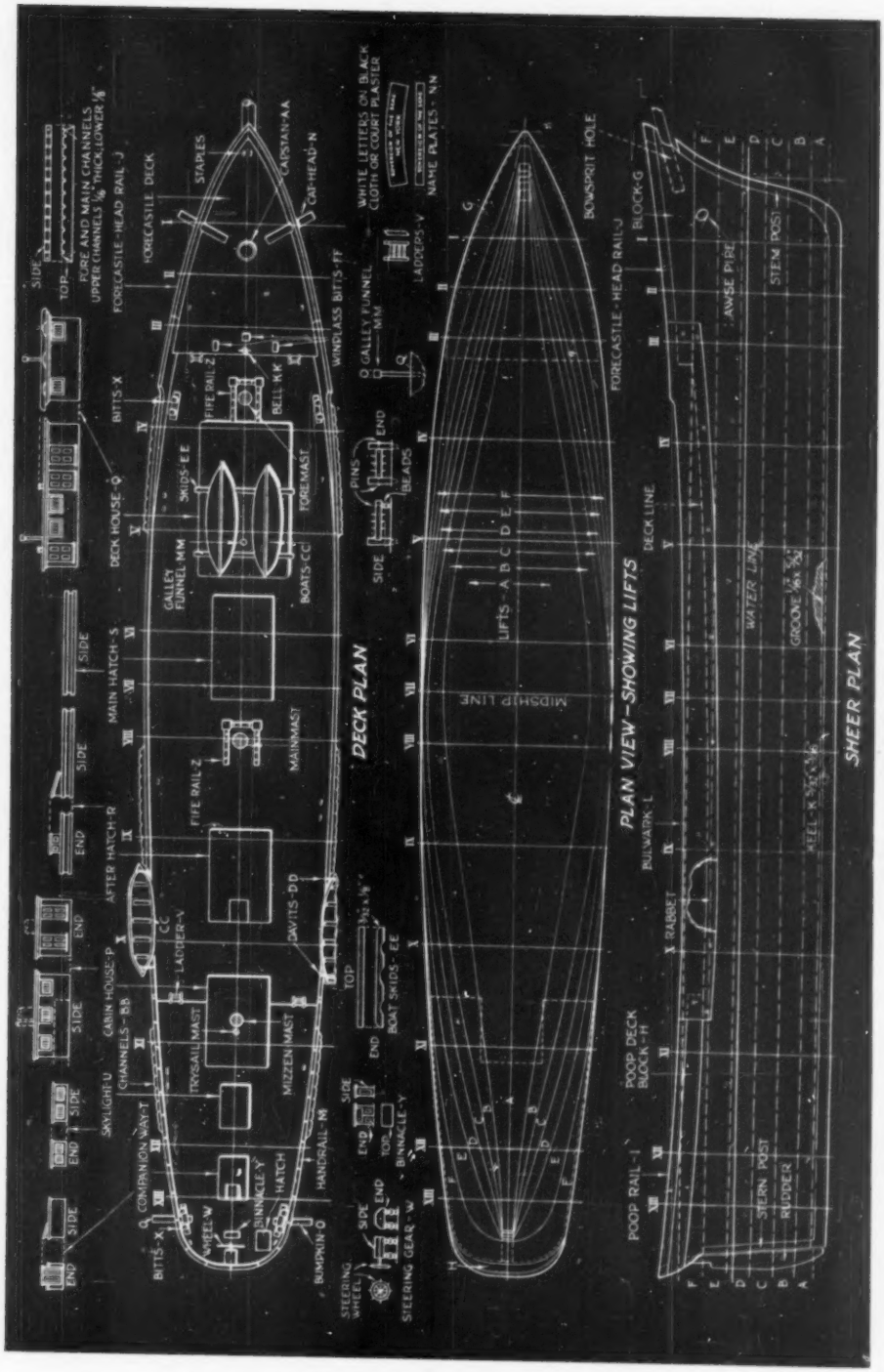
MASTS ARE MADE in same way as yards, but with single taper toward top. Tops, caps and crosstrees are cut from thin wood, fiber or plastic and glued on to join mast sections.



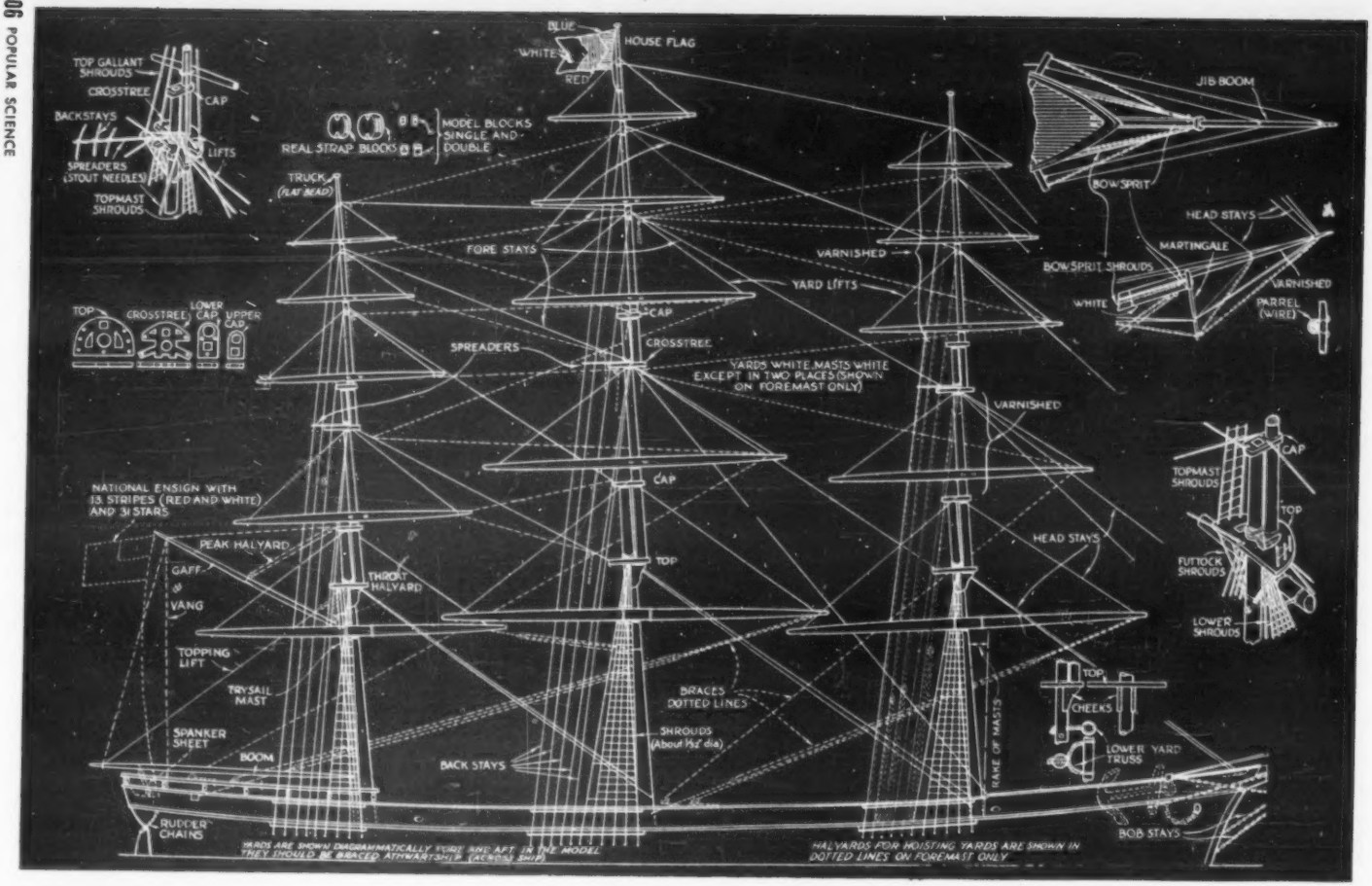
FORECASTLE VIEW shows lower foremast, fife rail, bitts and ship's bell. Pencil lines on deck simulate wood planking. Bell, blocks, other fittings can be bought at hobby shops.



CLOSE-UP OF MIZZENMAST shows top and cap that join topmast to lower mast. Lower shrouds pass through slots in top; topmast shrouds are threaded through holes in top.



Please turn the page for more ship plans.


TOP GALLANT SHROUDS
CROSSTREE
CAP
BACKSTAYS
LIFTS
SPREADERS (STOUT NEEDLES)
TOPMAST SHROUDS
REAL STRAP BLOCKS
MODEL BLOCKS SINGLE AND DOUBLE
TRUCK (FLAT HEAD)
BLUE
WHITE
RED
HOUSE FLAG
JIB BOOM
BOWSPRIT
HEAD STAYS
MARTINGALE
BOWSPRIT SHROUDS
VARNISHED
WHITE
PARREL (WIRE)
FORE STAYS
YARD LIFTS
VARNISHED
TOP
CROSSTREE
LOWER CAP
UPPER CAP
CAP
CROSSTREE
SPREADERS
YARDS WHITE MASTS WHITE EXCEPT IN TWO PLACES (SHOWN ON FOREMAST ONLY)
VARNISHED
CAP
TOPMAST SHROUDS
TOP
FUTTOCK SHROUDS
LOWER SHROUDS
NATIONAL ENSIGN WITH 13 STRIPES (RED AND WHITE) AND 31 STARS
PEAK HALYARD
GAFF
VANG
THROAT HALYARD
TOP
HEAD STAYS
TOPPING LIFT
TRYSAIL MAST
SPANKER SHEET
BOOM
BRACES DOTTED LINES
SHROUDS (About 1½" dia)
BACK STAYS
RAKE OF MASTS
TOP
CHEEKS
LOWER YARD TRUSS
BOB STAYS
RUDDER CHAINS
YARDS ARE SHOWN DIAGRAMMATICALLY FORE AND AFT IN THE MODEL THEY SHOULD BE BRACED ATTWARTSHIP (ACROSS SHIP)
HALYARDS FOR HOISTING YARDS ARE SHOWN IN DOTTED LINES ON FOREMAST ONLY

MODEL MAKERS can render small wooden sections so flexible they can be knotted (left above). Plastic, when steamed, can be bent.

Extra Uses for a Bottle Warmer

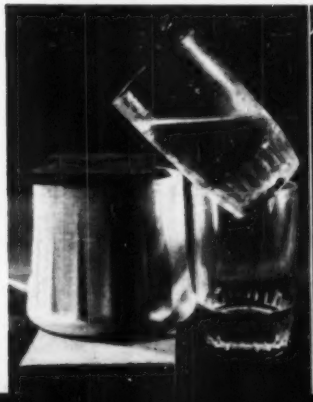
These electric gadgets boil water and generate steam so quickly that you can use them for many jobs.

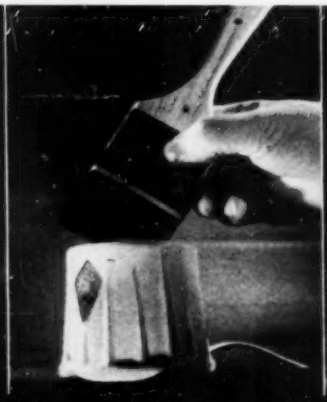
COOKS can use a bottle warmer to boil eggs or to prepare individual servings of baked potatoes or other vegetables.

DISTILLED WATER is made when steam condenses on glass of cold water and drips into lower glass. Partly cover warmer with cardboard.

PAINTBRUSH can be reshaped if you let steam soften bristles. While steaming, hold bristles loosely together with rubber band.

LABELS on bottles that you want to re-use can be removed in seconds. You can also remove stamps from envelopes in this way.





Brad Locks Caster

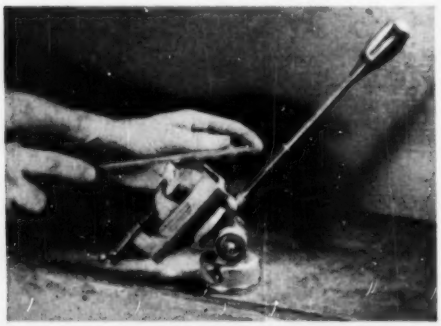
A TYPEWRITER table that rolls around on its casters while you're pounding away can be mighty annoying. Here is an easy way to lock the casters. Take off the two front casters and drill small holes through the rollers and bodies, as shown above. A brad slipped through the two holes will keep the roller from turning.

Nail Can Carried to the Job

WITH containers like those pictured above, you will never have to sort nails to find the right ones for the job at hand. Glenn Mann, Carthage, Ind., made one of the buckets for every size nail he keeps in his shop. They are gallon cans cut down and fitted with dowel handles. The buckets are carried to the job.—*George Laycock, Batavia, Ohio.*

Resurfacing Workbench

A WORKBENCH top that has become scarred and unsightly can be renewed simply by nailing on a panel of tempered hardboard. This material will withstand long, rough use.



Vise Plays All the Angles

MARRY a small vise to a camera-tripod head and you can swing your work to any direction. The vise is mounted by first attaching it to a bottom block of ¼" hardboard or aluminum in which a hole has been drilled and tapped for a ¼"-20 tripod-head screw. The head is fastened to the bench by a ¼"-20 bolt.—*Walter E. Burton, Akron.*

Rack Helps Keep House Neat

THE novelty of a boot-and-mitten rack all their own may induce the youngsters to hang up wet gear. This one is one-by-twos with 7" lengths of ½" dowel driven into angled holes 5" apart.—*K. Greif, Vestal, N.Y.*

Radio Helmet for Space Fans

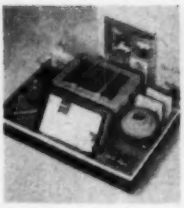
Mounted on a plastic eye shield, this real radio takes your kid out of this world—and it will make him captain of the crew.

"OVER 'n' out . . . over 'n' out" will really mean something to the boy who wears this radio helmet. The voice from the magnetic earphones may just be telling him the time, what to use on his hair or how to bake a cake. But to an imaginative modern lad it will be the control tower at the space academy giving vital instructions for coming in from outer space. Like the crystal sets of the early twentieth century, the outfit is self-contained and needs no batteries.

The miniature receiving station is built on a plastic eye shield—the type used by grinders or servicemen handling TV tubes. Heart of the set is a tiny germanium diode, type 1N34, connected between a coil and a brass handgrip, which serves as a ground by utilizing the body capacity of the wearer. A telescoping auto antenna brings in the signal, preferably from the strongest radio station in the locality. The coil shown is wound for 660 kc. (660 on a radio dial). Removing turns will bring the local station in stronger if it is transmitting above 660 kc.—*Elbert Robberson, Port Washington, N.Y.*

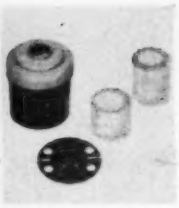
Easy-to-use materials for printing pictures—ideally suited for beginners. **Kodacraft Printing Kit, $4.95.**

Essentials for developing and printing pictures, including roll-film tank. **Kodacraft Photo-Lab Outfit, $9.75.**



Complete developing, printing equipment incl. metal printer. **Kodacraft Advanced Photo-Lab, $14.95.**

For efficient print drying. Stops tendency of prints to curl. Use it over and over. **Kodak Blotter Roll, $2.88.**



Easy to use. Simple to load in dark. Takes 620-120 and 127 roll films. **Kodacraft Roll-Film Tank, $2.53.**

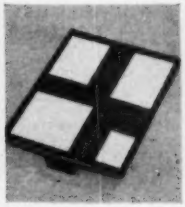
For simultaneous development of two rolls of 828 or 135 film. **Kodacraft Miniature Roll-Film Tank, $2.53.**

Save time—Shop here

for the photo fans on your Christmas list

These two pages give you some idea of the many useful and inexpensive gift ideas at your Kodak dealer's. Visit him soon. He'll be glad to help you choose just the right gift for every photo fan on your shopping list.

For accurate darkroom temperature control. You have choice of four **Kodak Thermometers, from $.55.**

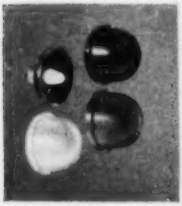


New-type printing frame of steel construction. Includes a set of masks. **Kodacraft Printing Frame, $1.65.**

Converts tray to efficient, trouble-free washer for prints or films. **Kodak Automatic Tray Siphon, $4.50.**

Tilting base, minute and split-second hands, large dial. Intervals up to 60 minutes. **Kodak Timer, $7.95.**

Chemical-resistant plastic housing protects all working parts. **Kodak Chemical Scales, $14.50.**



Includes three cups for darkroom work with both papers and films. **Brownie Darkroom Lamp Kit, $1.75.**

New darkroom safelight provides direct or indirect illumination—or both. **Kodak 2-Way Safelamp, $4.50.**

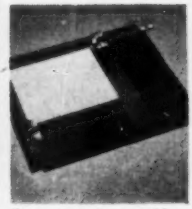
Can be used either from a drop cord or in a wall plug. Includes safelight filter. **Kodak Darkroom Lamp, $5.75.**

For wall, shelf, bench. Includes switch, cord, safelight filter. **Kodak Adjustable Safelight Lamp, $8.75.**

For determining correct printing time—saves both paper and time. **Kodak Projection Print Scale, $1.15.**

Cool, circline fluorescent lamp, integrating-sphere lamphouse are prominent features in each enlarger. Kodak Hobbyist Enlarger ***(left)*****, $37.50, complete with f/6.3 lens. Kodak Flurolite Enlarger** ***(right)*****, $99.50 (lens extra).**

Lenses for the Flurolite Enlarger range from **50mm. f/4.5 "Ektanon"** to **4-inch f/4.5 "Ektar."** From $15.00.



For accurate masking of enlargements with any vertical enlarger. **Kodak Masking Easel, 11 x 14. $15.00.**

View-type camera—permits one-to-one close-ups. **Kodak Flurolite Camera Combination, $69.50** (less lens).

Expertly made Kodak Field Cases make cameras easy to carry, offer sound protection together with smart appearance. Include fine-quality leather cases *(left)*, and durable simulated leather *(right)*. **Kodak Field Cases, from $2.65.**

Automatically trips shutter, permits photographer to get into picture. **Kodak Auto-Release, $3.86.**

Provides dependable "flash" for most internally synchronized cameras. **Kodak Standard Flasholder, $8.25.**

B-C (battery-condenser) flash insures longer battery life, sure synch. **Kodak B-C Flasholder, $10.40.**

For quick, easy multiple lighting, with Lumaclad reflector. **Kodak Flasholder Extension Unit, Model I, $11.00.**

Condenser-type power for dependable "flash." **Kodak B-C Flashpack, $2.95** (without 22½-volt battery).

Sensational new battery-condenser flash system. **Kodak Ektalux Flasholder** (Standard Bracket), **$29.75.**

Holds your camera and flash extension unit on most flat or tubular surfaces. **Kodak Flexiclamp, $4.95.**

For use with new Brownie Hawkeye Camera, Flash Model. Very easy to attach. **Kodalite Flasholder, $4.00.**

Permits close-range picture taking with most fixed-focus cameras. **Kodak Close-up Attachment, $1.63.**

Now, a filter designed for inexpensive box cameras—emphasizes clouds. **Kodak Cloud Filter, $1.85.**

It's easy to get extreme close-ups with both still and movie cameras with **Kodak Portra Lenses, from $2.65.**

Shades camera lens and reduces sky flare—attaches to adapter ring. **Kodak Lens Hood, from $1.75.**

Popular yellow (K2), red (A), and green (X1) filters to fit most cameras. **Kodak Wratten Filters. From $1.75.**

Two compartments hold 4 filters, adapter ring, lens hood. **Kodak Combination Filter Cases, $4.25, $4.95.**

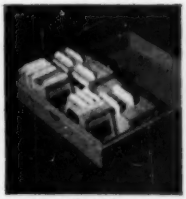
New-type slide-feeding mechanism, cool operation, elevating device. **Kodaslide Merit Projector, $26.10.**

Two superb new slide projectors. **Kodaslide Highlux III Projector** *(left)*, 300-watt; quiet fan; blower, carry case, **$56.50. Highlux II** *(right)* gives brilliant 200-watt projection. Converts to Highlux III. **$36.50.** Carry case, $7.50.

2x2 projector and screen in a single unit. Usable in fully lighted room. **Kodaslide Table Viewer 4X, $37.50.**

Projector, screen, changer in one unit. **Kodaslide Table Viewer, Model A, $97.50.**

Compartments for 240 cardboard or 96 glass slides. **Kodaslide Compartment File, $3.94.**



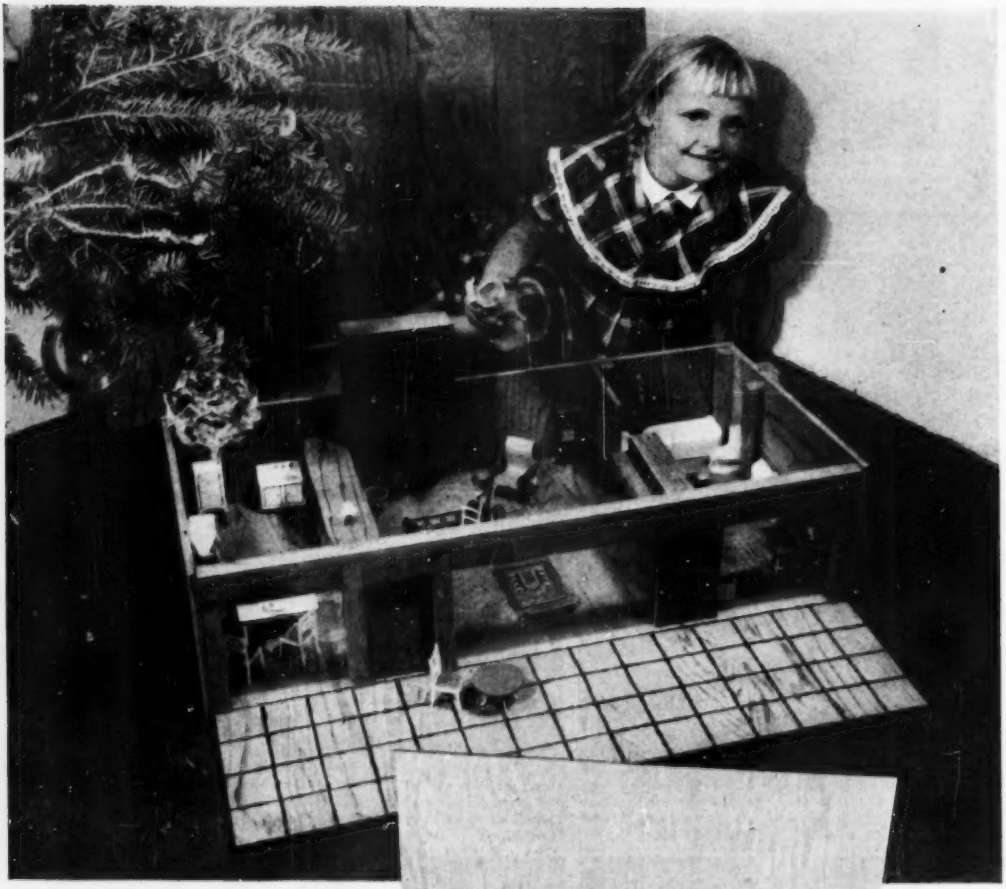
Holds 360 2x2-inch or 160 stereo slides. **Kodaslide Flexo File, $1.25.**

Materials for mounting 50 color transparencies in glass. **Kodak Slide Kit, $3.63.**

Prices include Federal Tax where applicable and are subject to change without notice.

Kodak
TRADE MARK

Eastman Kodak Company, Rochester 4, N.Y.



DOLLHOUSE PACKAGE at right is prefabricated in parts to be stored or mailed, quickly assembled Christmas morning, as shown above, with screws and brads. Parts can be fastened with glue later.

Prefab a Modern Dollhouse

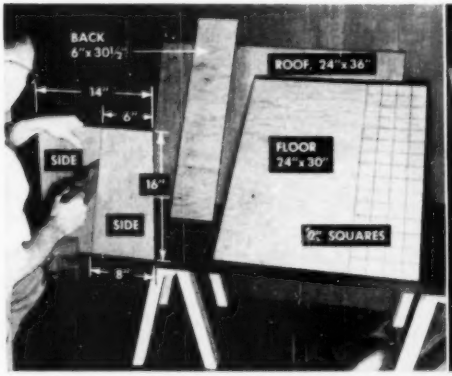
Picture windows not only give up-to-the-minute styling but let the young owner see inside without taking off the roof.

By Darrell Huff

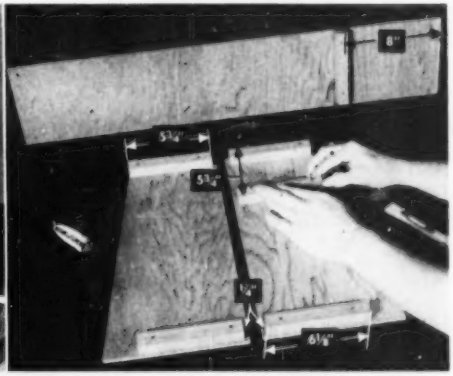
THIS dollhouse will delight any little girl because it is so modern—with a big picture window for her to show off to all how handsome it is inside.

And its modern simplicity means that it is easy to build. All the tools needed are a hammer, screwdriver, drill, coping saw and all-purpose saw.

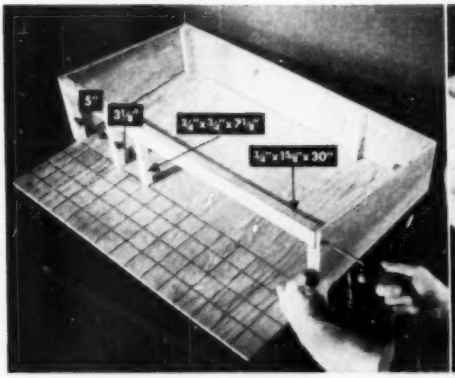
Materials needed include a 4′-by-4′ sheet of ¼″ plywood, 5′ of ¾″-by-¾″ wood, a 30″ length of one-by-two (¾″ by 1¾″), a 2″-by-6″-by-9″ wood block (for chimney), and clear sheet plastic to make the windows and bathroom partition.



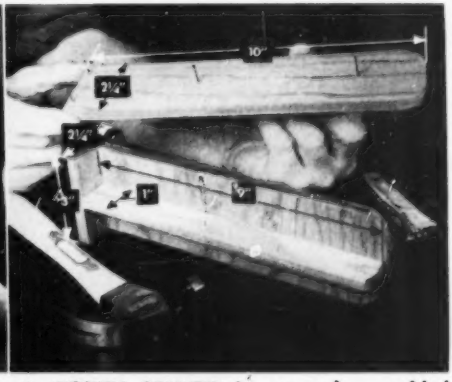
1. HERE ARE MAJOR PARTS. From plywood also cut 3″-by-6″ door, 5¾″-by-5¾″ bathroom wall, cabinet and storage wall. Squares give effect of tiled terrace.



2. CLEATS cut from ¾″-by-¾″ wood are located ¼″ from lower edge of sides and back so these three members can butt down over edge of floor. Glue and nail them.

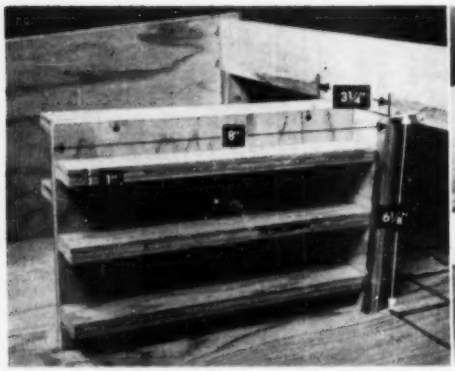


3. NOTCHES cut 1″ deep in lower edge of the crossbeam for the door posts will give a stronger construction. Screw major assemblies together so they can be taken apart.

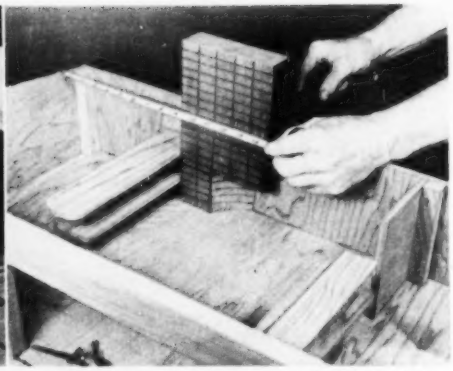


4. KITCHEN COUNTER is cut and assembled like this. There are two shelves back to back. Round corners of counter, partition and shelves. Assemble with glue and nails.

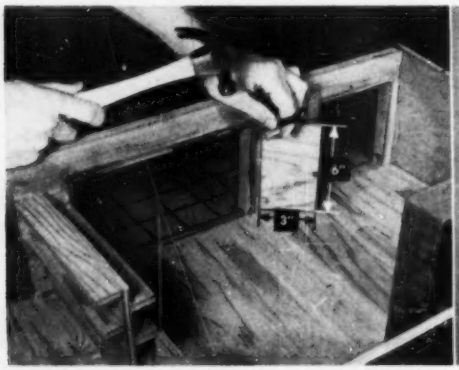
Please turn the page for more dollhouse photos.



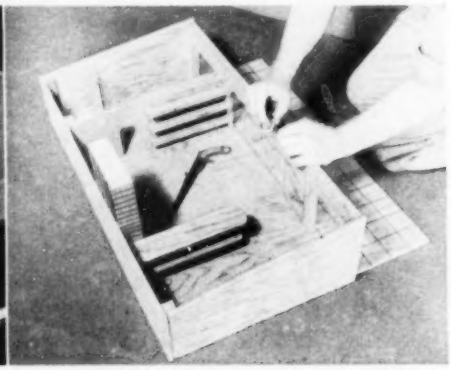
5. AFTER BUILDING STORAGE WALL locate it under front beam to form bedroom-living room partition. Locate it to leave space 5¾" wide for the bedroom window.



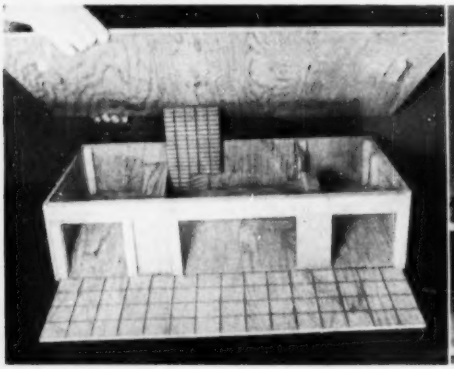
6. CURVED NOTCH in chimney block makes a fireplace. Rule or burn lines to simulate bricks. Locate its near edge 14" from corner. Nail bathroom wall in place.



7. TINY BOX HINGES hang the plywood door and the door knobs are thumbtacks. Dimensions given allow 1/16" clearance all around door. This can be reduced a bit if desired.



8. CUT PLASTIC to suit three window openings and a 5¾"-by-6" piece for bath partition. Tape in place for temporary use. Sanding will make bath partition opaque.



9. ROOF PANEL has hole for chimney, located so as to give symmetrical overhang of roof. Short cleats under roof hold it in place. Finish can be Firzite plus lacquer or paint.

10. THE YOUNG LADY will want to choose her own furnishings from the ingenious plastic miniature pieces that are available in many stores at Christmas time.

Tom McCahill says–

TOM MCCAHILL, well known, free-lance automotive journalist whose test reports of American and European cars appear regularly in *Mechanix Illustrated* magazine.

"The finest automobile engine in the world is no better than its weakest spark plug!"

"I've been around automobiles for a long time and have road-tested practically every make of hack put together on these shores or across the pond. You learn a lot about any engine when you start dishing out the punishment. But there's one thing you discover quickly—the finest engine in the world is no better than its weakest spark plug.

"Spark plugs may look small and unimportant but, brother, if you want that mill of yours to unleash all its horses make sure you have the best spark plugs money can buy. That's where Champions take the spotlight. I've had stock Champions go on delivering the mail in car tests that were downright brutal.

Furthermore, I've watched Champion-equipped cars cream everything in sight in the world's great speed, endurance and reliability runs—from Indianapolis "500" to the LeMans 24-Hours.

"So take a tip from your Uncle Tom, and get set for winter driving by putting dependable Champion Spark Plugs in your car. They're your best assurance of positive starting and worry-free motoring when, 'the north wind doth blow and we shall have snow'."

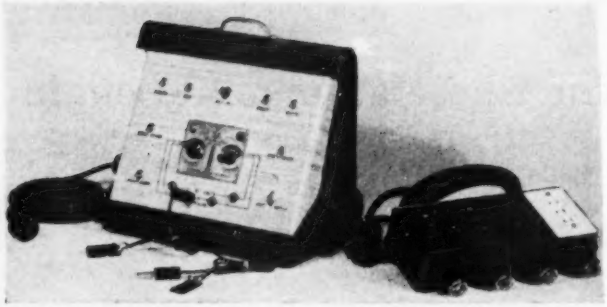
Stop in at the service station or garage displaying this poster!

AMERICA'S FAVORITE

CHAMPION

SPARK PLUGS

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO



CONTROL PANEL is lodged in neat case fitted with carrying handle. Train transformer is set into center, fastened to it with small machine screws through the corners of the face plate.

Control Panel Eases Christmas Light Problems

You're a boss electrician with five individually controlled outlets, plus a special rig for the train transformer.

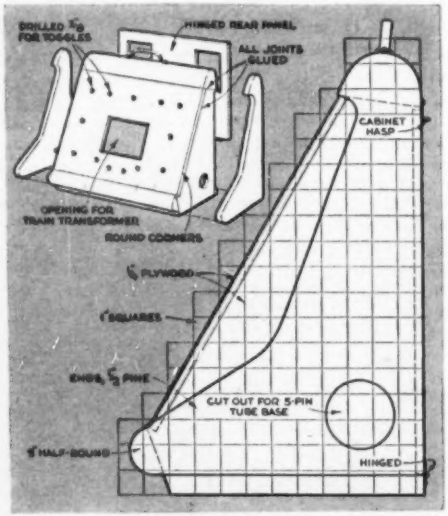
AT CHRISTMAS time you dream of a whole wall covered with electrical outlets—there never seem to be enough. This control board centralizes your Christmas-display lighting, and toggle switches permit individual control of everything, including the electric trains. During the rest of the year it will provide your shop more bench outlets than you'll ever need. If you can leave the train transformer on the board it will also give a wide range of low voltages for testing.

Cabinet. To grace the living room, the cabinet should be more than a box. The one shown was built from scraps of plywood.

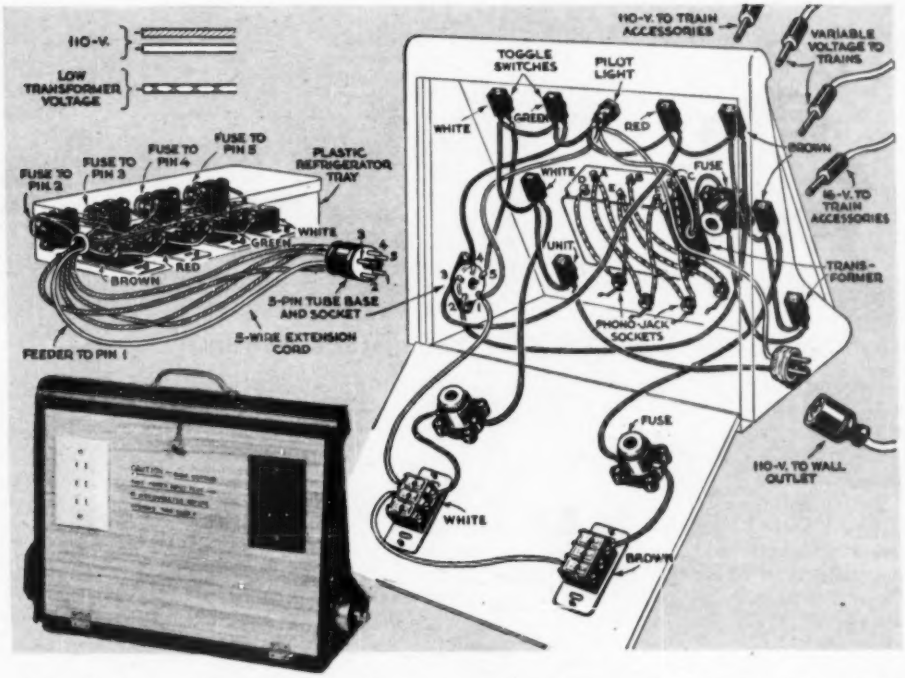
Wiring. The drawing on the next page illustrates the wiring arrangement as seen with the hinged back open. From this, you can trace and duplicate the wiring. Line voltage is picked up from a wall outlet and fed to the box by a heavy-duty extension cord.

This plugs onto a male plug fitted to the side of the box. Current is then carried to the neon pilot light and toggle switches through radio hookup wire. A five-pin tube base on the opposite side of the box carries current to four triple outlets built into half a plastic food-storage box. A five-conductor cable, long enough to meet your needs, links the outlet box to the control panel. Each circuit is protected by a five-ampere fuse in a light socket.

Train transformer. This is turned on by a toggle switch on the panel and is also guarded by a fuse. Extensions wired to



CASE for control panel is built of plywood covered with blond-mahogany plastic veneer on face, dark strip mahogany elsewhere. Back is hinged for easy access to wiring.



phono jacks carry variable low voltage to the tracks and fixed low voltage to the buildings and other scenic accessories.

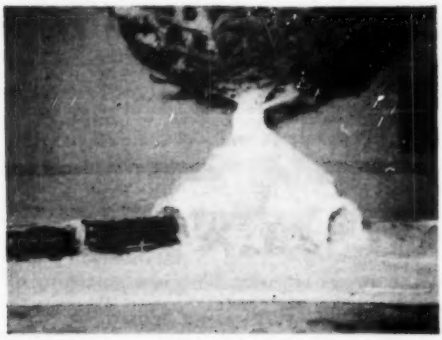
Many interesting effects can be obtained by running separate circuits of tree lights of different colors to the control board and lighting them in combinations.—*James T. Raymond, Emporium, Pa.*

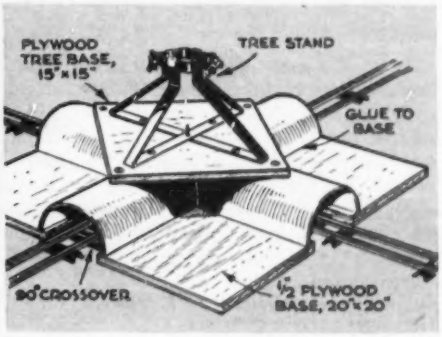
Tunnel for Trains Supports Christmas Tree

THIS four-portal tunnel adds scenic beauty to your Christmas train layout and supports the tree as well.

Backbone of the tunnel is the heavy cardboard tubing rugs are rolled on. Two pieces 20″ long are cut and joined to form a double through way that covers a 90° track crossover. This permits trains to run in and out of the tunnel in a figure-eight layout. A commercial tree stand mounted on a separate base is then screwed to the tubes. The entire structure is covered with chicken wire and plastered over, adding weight.

A coat of canned artificial snow completes the winter setting for the tunnel.—*N. A. and B. M. Coomer, Jackson, Mich.*

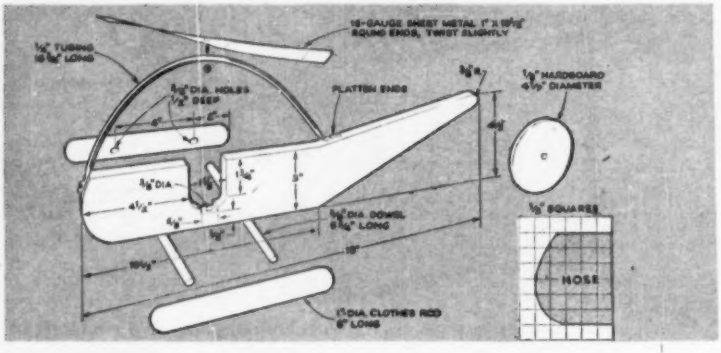




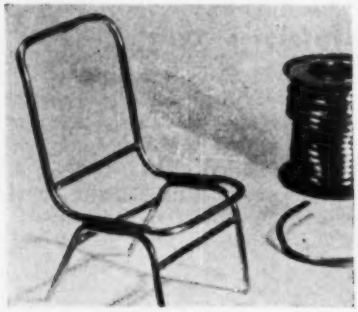
Toy Copter Will Light Up Your Youngster's Bedtime

A NIGHT light that is also a toy helicopter will gladden a young boy's heart. It can be made from scrap wood.

Both the main rotor, fastened with a machine screw and nuts, and the screwed-on tail rotor turn. Shape the fuselage cutout to suit the socket used. A blue or green bulb gives a pleasant light.—*Robert H. Hawkins, Morton, Ill.*

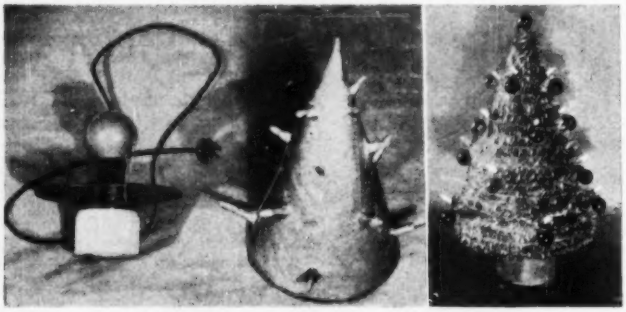


Solder Makes Doll Chairs



IF YOUR daughter insists that her dollhouse would be more attractive with modern wrought-iron furniture, it can be quickly made from solid wire solder. Available in 1/16" and ⅛" diameters, the solder bends easily into any shape. Cellulose tape and household cement make the joints. Cemented-on scraps of fabric provide realistic-looking upholstery.—*Richard J. Decker, Brooklyn.*

Plastic Pipes Light to Trim Table Tree



THE tiny "lights" that sparkle brilliant color all around this unusual table tree aren't real bulbs at all. They are bits of acrylic plastic rod (Lucite or Plexiglas) which pipe light from an ordinary 40-watt bulb hidden inside the "tree"—a cardboard cone covered with tinsel. The light stays inside the plastic rods, as though in pipes, until it reaches the pointed, roughened ends. Then it emerges, visible, to make the plastic points gleam like tiny bulbs.

The socket for the 40-watt bulb can be mounted on a base improvised from wood scraps. Be sure to provide ventilation holes.—*L. Carpenter, Los Angeles.*

NOW
a power tool that's

Really New!

SHOPMASTER'S *Sensational* 20" JIG SAW with Self-Contained Motor

Think of it—this rugged 20-inch jig saw has its own built-in motor! Not a solenoid or a vibrator, but a full-rotating armature, powerful AC motor.

A rugged, professional power tool that cuts up to 2½" stock with ease, this newest of all power tools makes precision woodworking actually easy. Shopmaster's EXCLUSIVE COMBINATION MITRE GAUGE AND RIP FENCE accessory sees to that!

Want to rip? Just turn saw head 90°. It's that simple. Truly the most outstanding QUALITY power tool value on the market today!

Just plug it in

(Exclusive combination mitre gauge and rip fence available at slight extra cost.)

$39.95 *Motor included*

Slightly higher in zone 2

OTHER FAMOUS **SHOPMASTER TOOLS**

FAMOUS UNIVERSAL COMBINATION TOOL

WRITE FOR FREE CATALOG
There's a Shopmaster power tool for every need. Write today for catalog of complete line.

SHOPMASTER, INC. Room 11F
1214 South 3rd St. • Minneapolis, Minn.

Road Map

By Darrell Huff

EVER poked around frantically for a mislaid map while friends wait for you to show them the route? Sure. Chances are some of the people on your Christmas list have, too. Here's a simple, neatly designed table that keeps the map where it can't be lost, right on the table top. And it makes a novel Christmas gift.

The map comes free from a service station. As shown in the pictures at left, you have to vary the shape of the table to fit the shape of the state you want to use. The photographs below show how to build a table for California, Michigan, Massachusetts, Florida or Louisiana, but tables for other states are made in the same way. Any lumber of 1" to 1¼" actual thickness will serve.

Redwood or pine will cost you as little as $2. You can turn out several tables for friends in a few evenings.

Narrow rectangle accommodates:

United States	Vermont	Illinois
Tennessee	New Hampshire	Mississippi
Oklahoma	Delaware	New Jersey
Kentucky	North Carolina	

Wide rectangle accommodates:

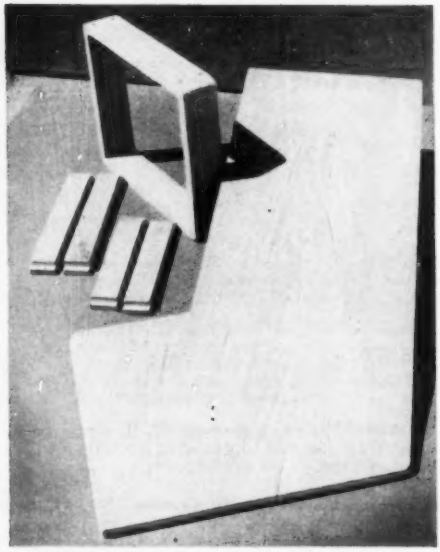
Iowa	Washington	Indiana
North Dakota	Oregon	Utah
South Dakota	Connecticut	Missouri
Nebraska	Georgia	Minnesota
Kansas	Alabama	Texas
Montana	Pennsylvania	Colorado

Square accommodates:

Ohio	Rhode Island	Arizona
Maine	Wyoming	New Mexico
Arkansas	West Virginia	Wisconsin

Triangle accommodates:

New York	Nevada	Maryland
Idaho	Virginia	South Carolina

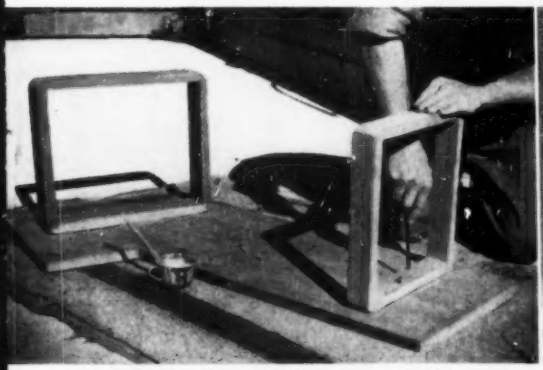


1. GLUED-UP TOP has corrugated fasteners at joints on both sides. Legs are shallow boxes made of rabbeted pieces glued and screwed together. Corners are then rounded.

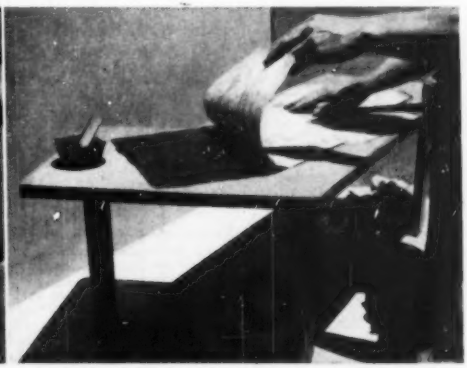
Tops Gift Table

There's no hunting for a map when it's fixed to the table top. Two dollars will build this project—and friends will like it.

Finished table is handsome enough for the living room, but tough enough to use outdoors.

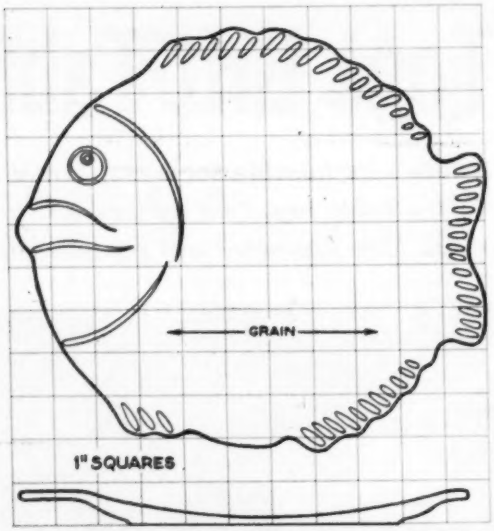


2. LEGS ARE FASTENED to top with water-resistant glue and screws. For this table, one leg box is 3" by 16¾" by 14½"; the other is 2" by 12¾" by 14½".



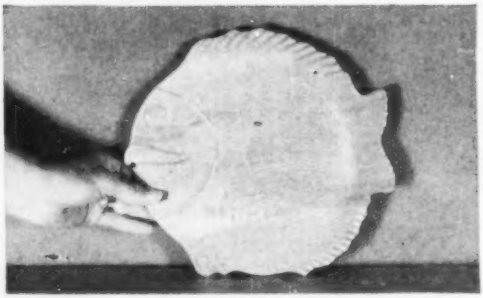
3. MAP IS TRIMMED to outline, glued to top. After glue dries, clean map with sandpaper and feather edge to blend into table top. Clear lacquer finishes table, map and all.

Wood Fish Makes Snack Plate



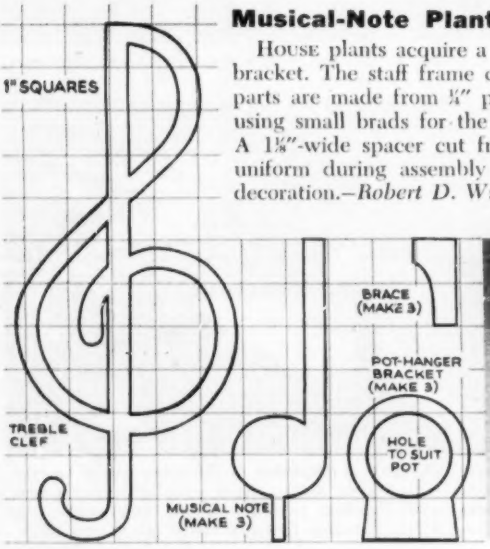
SANDWICHES and cookies are the specialty of this turned-and-carved plate. You need a hardwood block—solid or glued up—1" by 11" by 11", which is turned to make the dish and then sawed to the fish outline. A 4"-square block glued to the back will eliminate faceplate screw holes in the finished job and can be chiseled off later.

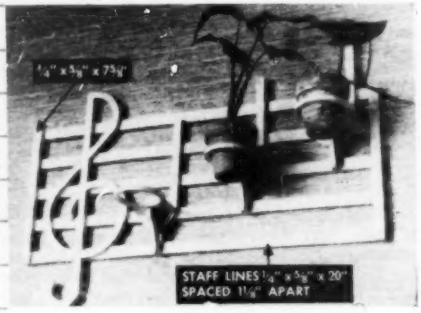
The head, fin and tail grooves can be routed or carved with a jackknife. Sand carefully and apply several coats of lacquer.—*Vern Forsberg, Seattle.*



Musical-Note Planter Tunes to Your Room

HOUSE plants acquire a musical air when set in this simple wall bracket. The staff frame can be any ¼" stock, while the jigsawed parts are made from ¾" plywood. Assemble with glue and brads, using small brads for the frame and ½" ones for the pot holders. A 1⅛"-wide spacer cut from scrap will help keep the staff lines uniform during assembly of the frame. Finish to suit the room decoration.—*Robert D. Wray, Worthington, Ohio.*





NEW! ALUMINUM STORM WINDOWS EASIER TO MAKE THAN WOODEN ONES!

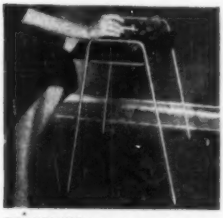
Make and repair countless other things around your home with amazing new

REYNOLDS Do-It-Yourself ALUMINUM

No Special Tools . . .
No Special Skills Required!

This amazing new kind of material opens up a brand new field for the home owner and hobbyist. It has the beauty and strength of regular aluminum. But Reynolds *Do-It-Yourself* Aluminum, made by the makers of Reynolds Wrap, is specially engineered for amazing workability. You can cut it with scissors, drill it, bend it, shape it and plane it, using ordinary hand *or* power tools. And it's so easy to use that even an amateur can become an expert overnight!

Wally Cox, TV's Mister Peepers (Sunday nights, NBC-TV) shows one of the aluminum storm windows you can make with Reynolds *Do-It-Yourself* Aluminum. These storm windows . . . so much easier to make than wooden ones . . . are permanent, rustproof, attractive, can be made with either glass or plastic panes.



END TABLES like this, made easily and quickly with new Reynolds *Do-It-Yourself* Aluminum, are smart, modern . . . cost very little.

WALL PROTECTOR made in an hour using Reynolds *Do-It-Yourself* Embossed Aluminum Sheets is just as handsome as it is practical.

FISHING NET and light, strong fishing rod cases are simple projects with Reynolds *Do-It-Yourself* Aluminum, make fine Xmas gifts.

HOUSE NUMBERS add an expert decorator's touch to any house, are easy to make with Reynolds *Do-It-Yourself* Aluminum.

ORDINARY HAND OR POWER TOOLS WORK FINE ON THIS FABULOUS NEW MATERIAL

SAW IT PLANE IT DRILL IT BEND IT CUT IT

CAUTION: Regular aluminum may harm tools . . . use only Reynolds *Do-It-Yourself* Aluminum. Each piece has Seal attached.

Look for this Self-Service rack containing REYNOLDS Do-It-Yourself ALUMINUM at hardware and lumber supply dealers everywhere

Tubes • rods • bars • plain sheets • embossed sheets angles • fasteners • screen and storm window sections window hardware • plastic sheet • trim moulding

APPROVED BY:
Atlas • Delta • Disston • DeWalt Black & Decker • Stanley Skil Corporation and other Leading Tool Makers

FREE BOOKLET is available with instructions and projects for Reynolds *Do-It-Yourself* Aluminum. See your dealer or write Reynolds *Do-It-Yourself* Aluminum at address below.

REYNOLDS *DO-IT-YOURSELF* ALUMINUM • 2503 South Third Street, Louisville 1, Kentucky

CANDLE WARMER. All you need is a trivet, three short pieces of copper tubing and a block of wood. Bore holes in wood for tubes, spacing them to suit feet on the trivet.

COOKBOOK HOLDER. This is two pieces of hardboard with a length of one-by-two sandwiched between. Fasten hardboard to narrow edges of wood strip with screws.

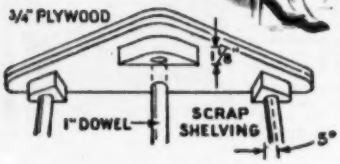
A Project

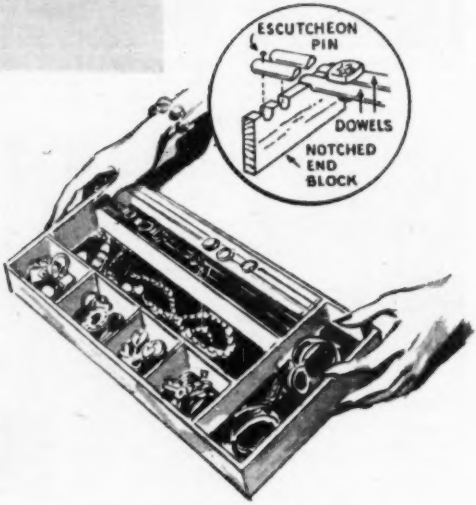
for Christmas

Knickknacks for the Ladies

SNACK TABLE. This store-easy table has legs that pull out. Triangular plywood top is fitted with corner blocks that are drilled at 5° angle to take dowel-rod legs.

JEWELRY TRAY. Make it from a wood knife box. Wood dividers nailed in one section form compartments, and two pairs of dowel rods placed together make earring rack.





A GIFT FORMULA FOR YOUR COMPLETE WORKSHOP

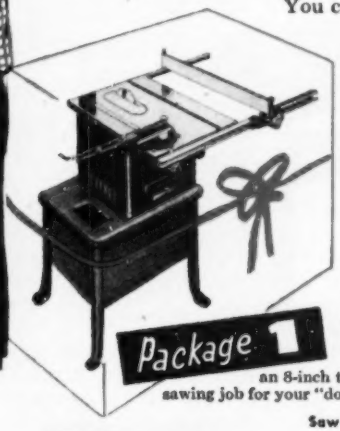
GET IT OR GIVE IT!

Build the One-Motor DELTA SHOP A TOOL AT A TIME

Now you can get the wonderful one-motor DELTASHOP on a year-around gift plan.

You can start with the saw this Christmas and add the other tools throughout the year. Ask your family to start you on the Deltashop "Add-a-Tool" gift plan this Christmas, or start yourself and let the family take it from there.

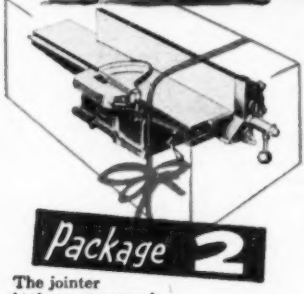
Here's how it works:



Package 1

The circular saw and stand for Xmas. A Delta Homecraft quality saw—with an 8-inch tilting blade—handles every sawing job for your "do-it-yourself" home projects.

Saw and stand only . . . $109.80



Package 2

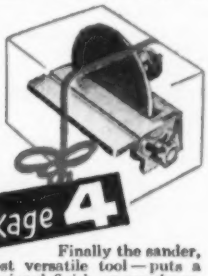
The jointer is the next natural gift—a fine tool that puts a true "finish" edge on a board and planes stock 4 inches wide.

4" Jointer, only . . . $49.15

Package 3

Comes the drill press for the birthday or Father's Day—a Homecraft 11" drill press, none finer. Does a multitude of jobs; no shop complete without one.

11" Drill Press, only...$57.50



Package 4

Finally the sander, a most versatile tool—puts a professional finish on wood surfaces; also can be used to grind, buff, polish—a real handyman tool.

8½" Disc Sander, only . . . $17.55

You get these packages for the same total price as the complete **DELTA SHOP**

The DELTASHOP is a complete home-workshop that does 95% of home do-it-yourself projects, occupies only a 3-foot square, and pays for itself quickly by savings on home repairs and improvements. Keep it anywhere, move it anywhere, use it anywhere, indoors or out.

Make it a "must" to see this remarkable tool demonstrated—at your local Delta dealer, department store, or your nearby IRHA hardware store.

Also send for catalog of famous Delta "How to do it" books. *Delta Power Tool Division, Rockwell Manufacturing Company, 504M North Lexington Avenue • Pittsburgh 8, Pennsylvania.*

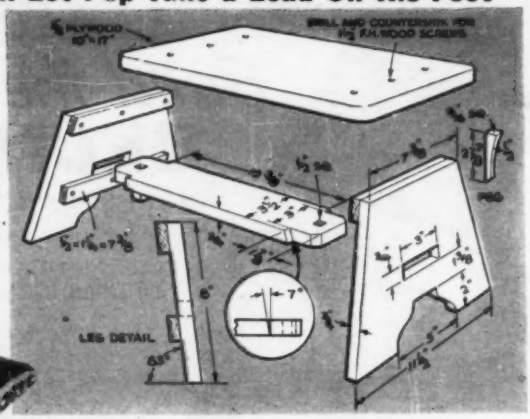
Prices slightly higher west of the Rockies

DELTA QUALITY POWER TOOLS

Another Product of **Rockwell**

DELTA QUALITY MAKES THE DIFFERENCE

Easy-to-Build Footstool Will Let Pop Take a Load Off His Feet



Pop's going to be pretty tired by nightfall Christmas Day. He'll be glad to put his feet up on this handsome footstool. And making it is pretty simple. Fir plywood scrap will do for the top, and almost any ¾" solid stock can be used for the rest.

Make a cardboard template for the ends so that they will be exactly alike. The scroll on the bottom will have to be done on the jigsaw. To saw out the mortises for the stretcher, drill starting holes, then tilt the jigsaw 83°. Drill holes for the pegs, squaring them with a chisel. Cut and attach the ½" cross strips with glue and screws. Two coats of orange shellac, each rubbed down with fine steel wool, will give a natural finish.

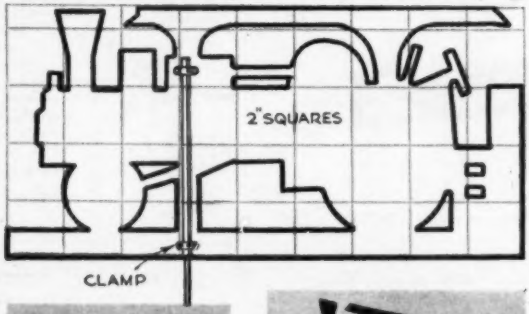
Cover the top with a 13"-by-21" piece of leatherette over a 1½" layer of upholsterer's cotton. Tack the plastic to the underside with carpet tacks, then add decorator's tacks around the edge.

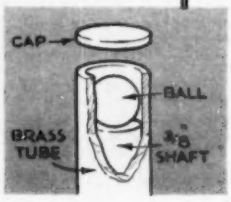
Old Steam Traction Engine Tells Which Way the Wind Is Blowing

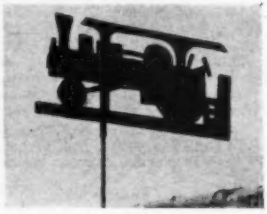
STEAM traction engines once plowed the soil and threshed our grain, clanking from farm to farm between jobs. This weather vane brings back memories of those awkward but fascinating machines.

Transfer the pattern by means of a grid to a sheet of fairly stiff copper, aluminum or galvanized iron. Cut to shape with shears, a metal-cutting coping saw, or hammer and chisel.

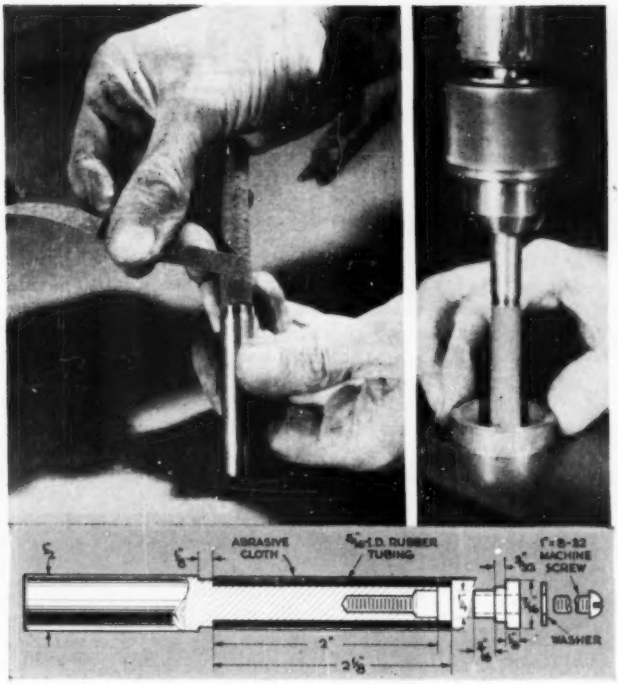
Solder or clamp the vane on a bearing tube as shown in the drawing. Grease and slip the tube onto a firmly mounted shaft, with a steel ball as a thrust bearing. Compass points can be bent from wire or cut out from a piece of sheet stock if desired.





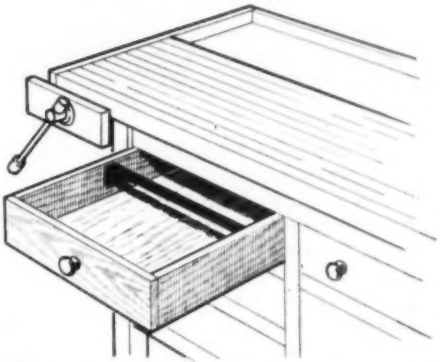


NEW Shop Ideas



Sanding Spindle. A strip of abrasive cloth about 5/16" wide wrapped around this drill-press attachment forms a sanding spindle for inside curves. The strip is started by wrapping it over itself at the shank end, completed and secured at the bottom under a washer held tight by a machine screw. The strip must be wrapped from right to left so that it won't unravel in use. Removable sleeves can be made by gluing strips over heavy paper.

Paint Lines Compressor Tank. Condensation is your compressor tank's worst enemy. It settles at the bottom and slowly rusts the tank away from the inside. Once the rust has started there's little you can do about it, but if your outfit is fairly new, you can protect it by pouring good enamel or thinned red lead in the tank, sloshing it around to coat the inside and draining it.—*William Schlueter, North College Hill, O.*

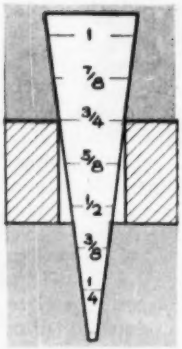


Bench Drawer Goes to Job. A small handle built into the center of your workbench drawers permits you to haul them out and carry them to jobs outside the shop.

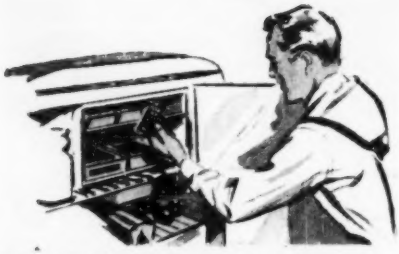
Spaghetti Extends Oil Spout. To oil hard-to-reach working parts of shop machinery, extend the spout of your squirt oilcan by slipping on a length of insulating spaghetti. This plastic tubing is available at radio-supply and hardware stores. Pick a size to fit the oilcan spout.

Please turn the page for more shop tips.

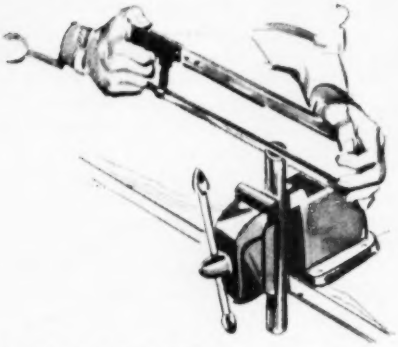
MORE SHOP TIPS



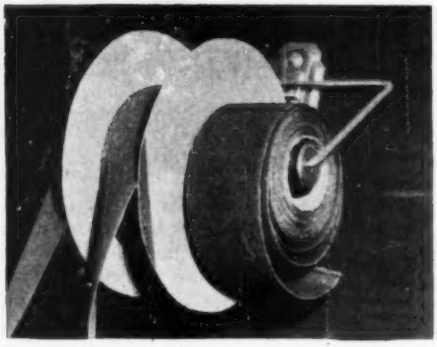
Gauge Measures Holes. Thin flat steel cut to a taper of 2" to the foot (about 9½° included angle) makes a gauge for checking the diameter of holes. After cutting the blank, measure the various widths of the taper and mark it off by eighths or sixteenths. Less taper increases accuracy.—*Federico Strasser, Santiago, Chile.*



Frozen Rubber Machines Easily. Sawing, cutting or machining soft rubber to form small parts usually results in a hacked-out job. Your troubles are over, however, if you freeze the rubber in a home freezer. It will then be hard enough to be drilled—even turned—without difficulty, and the finished product has the appearance of a molded part.—*Burns Hansen, Salt Lake City.*

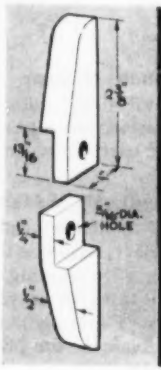


Saw Blades Cut Wide Slots. Three hacksaw blades side by side will cut a neat slot ⅜" wide. Light filing smooths the bottom. Other widths can be obtained by joining two, four or more blades.—*William H. Eichhorn Jr., Highland, N. Y.*



Tissue Holder Stores Emery Strips. Compact storage and easy selection of the grit needed for a job are the chief advantages of mounting rolls of abrasive strips on a toilet-tissue holder. You can pull out and tear off the length you need.

Two-Piece Lock Is Tamperproof. The usual tool-chest lock is easy prey for a heavy screwdriver. This two-piece arrangement cut from ½" steel is attached from inside with machine screws. A husky padlock slipped through the mating holes provides real security.—*G. W. Hall, Brooklyn.*



Why pay more?

You can install a guaranteed

KENTILE FLOOR

like this for only $27.50*

A KENTILE FLOOR LIKE THIS COSTS $9 to $22 LESS THAN TILE FLOORS OF MANY OTHER MATERIALS... YET KENTILE IS GUARANTEED!

You can't imagine how easy it is to install your own Kentile Floor until you've actually done it. Mix or match your choice of the 25 "lovely-to-live-with" colors. Kentile resists soil and stains. And, after parties or just family-fun, Kentile is easy to mop clean. It's easy to keep glistening like new with an occasional no-rub waxing, too. These modern colors can't get dull or wear off . . . they go clear through the rugged, durable tile. That's why more people buy Kentile . . . because Kentile gives more value.

Only KENTILE DEALERS have these money-saving buys in GUARANTEED FLOORS

KENTILE GUARANTEE

Kentile, Inc., will furnish new tile without charge for any Kentile that wears out ... and on which colors wear off ... during your own occupancy of your own home wherein you have installed Kentile or have had it installed by an authorized Kentile Dealer. This guarantee does not apply to damage caused by your improper handling or your failure to follow the instructions for installation and/or maintenance available at your Kentile dealer's. This guarantee must be presented if claim is made for new tile.

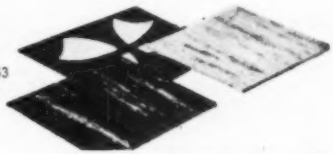
* Price quoted is for a floor approximately 11'6" x 9'3" installed by you. Your floor may cost less or slightly more depending on size, colors and freight rates. See your local Kentile, Inc. Dealer for FREE estimate. His name is listed under FLOORS in your Classified Telephone Directory. In Canada, T. Eaton Co., Ltd.

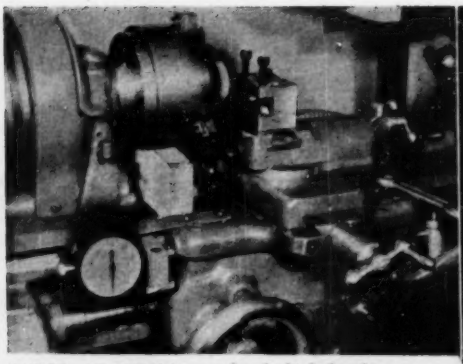
KENTILE, INC., 58 2nd Avenue, Brooklyn 15, N. Y.

KENTILE®

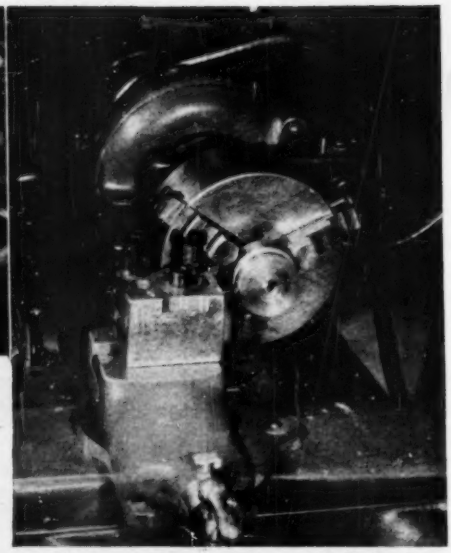
The Asphalt Tile of Enduring Beauty

Copyright 1953 Kentile, Inc.





BLOCK OF WOOD, wedged lightly between chuck and lathe bed acts as brake to eliminate backlash. Indicator must be set at zero on first cut to utilize full .250″ of stem travel, otherwise it must be reset to finish job.



HERE'S A TYPICAL COLLAR cut with dial-indicator indexing setup. Graduations are cut about .005″ deep and every fifth one is longer. Numbers are stamped beside long marks.

Dial Indicator Graduates Collars in Lathe

EVEN if your lathe has provision for indexing (and many lathes do not), cutting fine graduations on a collar or dial can be a mean job. Here's a setup that skips the indexing and lets a dial indicator relieve you of the eyestrain.

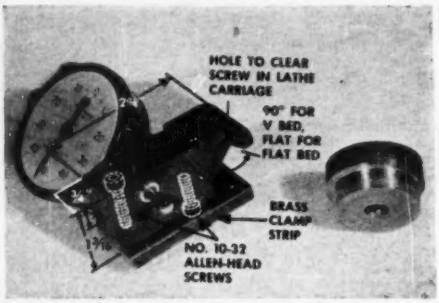
Clamp the dial indicator to the lathe bed and set the lead-screw gears to feed the carriage four threads per inch. This gear train will advance the carriage ¼″ (.250″) with each revolution of the spindle. The .250″ of carriage travel can then be accurately indexed with the readings on the dial indicator.

If, for example, you're making a dial for use with an 8-t.p.i. screw, 125 graduations are needed. As each .001″ on the indicator is equal to 1/250 of a full spindle turn, cutting a mark at each .002″ will produce 125 graduations on your homemade collar.

Cut the marks by advancing the compound to move a V-shaped cutter clamped on its side across the surface of the collar. Back it off, rotate the spindle to the next .002″ and advance the compound for the next cut. Depth of cut is established by the cross-feed. Chalk the work and scribe two light lines to limit the length of the marks; every fifth one made longer. Stamp appropriate numbers over each of the longer graduations.

The most common feed-screw-and-collar combinations are:

Screw 40 t.p.i., collar 25 graduations, used on American micrometer; screw 10 t.p.i., collar 100 graduations, used on lathe cross-feed and compound; screw 8 t.p.i., collar 125 graduations, used on milling-machine feeds.—*Bernard J. Corey, Thorold, Ont.*



INDICATOR BRACKET is cut from block of red fiber; hardwood or brass could be used. Stem of indicator is clamped in slotted hole running parallel with lathe bed. Dial at right is 1½″ diameter, with 125 graduations.

Photo Labels Can't Smear

LABELS on jugs of photo chemicals won't become messy and illegible if you cut the labels off the cans the chemicals came in and fasten the metal strips around the necks of the jugs.—*R. C. Blomberg, St. Paul.*

◊◊◊ **3rd of a Series**

What every Automobile man should know about Power Steering

The fastest-growing innovation in automotive history is Power Steering—and the leader in Power Steering is SAGINAW, world's largest producer of steering gears. Saginaw Power Steering is now available on all General Motors cars and three other well-known makes. Nearly 600,000 new cars have been equipped with it—more than all other types combined. So naturally, many people wonder:

6. HOW DOES SAGINAW POWER STEERING OPERATE?

Basically, it is simply a highly efficient recirculating Ball Nut Steering Gear with a built-in hydraulic assist. This consists of a pump which delivers oil at 750 pounds per square inch, a reservoir, a double-acting hydraulic cylinder, and an ingenious spool-type control valve, as shown in simplified Diagram 1.

The spool valve, part of the steering shaft, is a grooved cylinder machined to a sliding fit within the grooved valve housing. The spool revolves with the steering shaft, can slide forward or backward about .060" and still retain the high-pressure oil. Whenever *less* than three pounds pull on the steering wheel is needed, the valve remains in "neutral" position, as shown in Diagram 1, and the circulating oil by-passes the power cylinder. *No hydraulic force whatever is applied to the steering mechanism,* and the car remains completely under manual control. This assures the "feel of the road" SAFETY ZONE which distinguishes Saginaw Power Steering from ordinary types.

However, as soon as *more* than three pounds pull is needed, the resistance of the wheels causes the ball-nut and screw assembly to act as a jack. If the turn is to the *left,* this forces the whole steering shaft, including the valve spool, imperceptibly *toward* the driver, as shown in Diagram 2. This changes the course of the oil, so it now flows to the front of the power cylinder and forces the piston backward. Power assistance is thus applied to the pitman arm, to help turn the wheels to the left. At the same time, oil pressure on the valve plungers tends to move the steering shaft and spool back to neutral position, which cuts off the flow of oil to the power cylinder.

When the steering wheel is turned to the *right,* the spool moves slightly *away* from the driver. The oil flows to the opposite end of the power cylinder and forces the piston to assist in turning the front wheels to the right.

The whole system also acts in reverse to resist any force, such as a blowout, which tends to twist the wheel from the driver's hands. When a road shock is transmitted through the pitman arm, the resulting movement of the valve spool admits oil to the proper side of the power cylinder to counteract the shock. Note, too, that a by-pass valve is provided which opens in case of pump failure, so there is no resistance to manual steering.

IF YOU'D LIKE TO LEARN MORE—we'll be delighted to send you "THE *FACTS* ABOUT POWER STEERING."

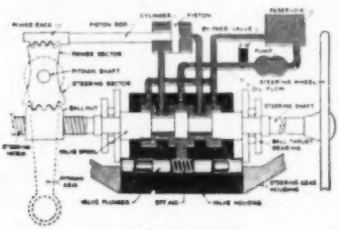


Diagram 1

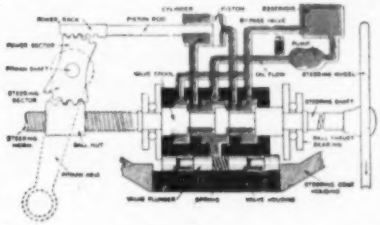


Diagram 2

Saginaw

POWER STEERING

Saginaw Steering Gear Division
General Motors Corporation
Saginaw, Michigan (Dept. S)

Please send a free copy of "The *Facts* About Power Steering."

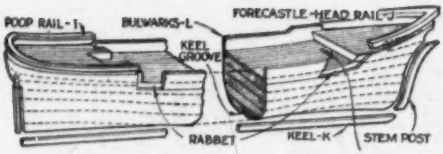
NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

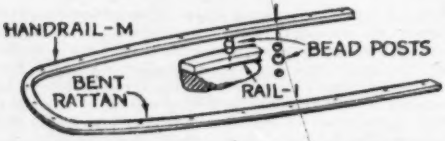
World's Fastest Clipper Ship

[Continued from page 204]



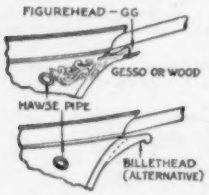
The poop rail is cut from ⅛" pine and the forecastlehead rail from 3/16" pine. Both are glued on oversize and then sanded down to the proper flare. The poop handrail is a slim strip of rattan cane with beads for posts glued onto straight pins at ¾" intervals.

The keel, stempost and sternpost are ⅛"



hardwood and are glued on next. The two moldings that encircle the ship at the upper and lower edges of the bulwarks are half-round rattan sanded down to about 1/32" thick after they are glued on the hull.

Bowsprit and bumpkins. The bowsprit fits into a ¼" hole drilled in the bow. The figurehead that goes below it can be a wood carving or simply a wood curl, called a billethead, as shown at left below.



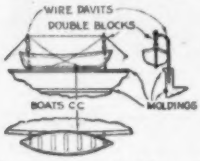
The catheads and bumpkins are ⅛"-square hardwood. Drill holes in the rails for them, file the edges square, and nail the pieces to the deck. Bore 3/16" holes for the hawsepipes, and nail on the rudder, thinning it slightly from ⅛" at the sternpost toward the after edge. Bore the four 3/32" holes in the bulwarks, and glue on the ⅛"-by-3/16" channels. The mizzen channels are 1⅞" long, the others 2¼".

Painting the hull. Give the decks two coats of shellac, rubbed down with steel wool and then waxed. The inside of rails, bulwarks and ends of forecastle and poop are white, the hawsepipes red.

Before painting the outside of the hull, drill all holes for masts, bitts, capstan and other deck fittings, and insert deck staples, made of bent pins with their heads cut off. Prime the hull first with flat white, sand smooth and mark on the water line. Then paint the bottom copper, with a flat grayish-green stippled or wiped on over it. Above the water line is dull black, with a white bowsprit and figurehead.

Deck fittings. Deck houses, skylights, hatches, companionways and binnacle are all blocks of wood with tops glued on and painted white. Their size and window arrangements are shown on the deck plan.

The wheelbox and top of the binnacle are mahogany. Doors and windows are painted on in reddish brown. Bitts, fife rails, boats and skids are white, windlass bitts white or natural, capstan and galley funnel black, and ladders natural. The rigging for the lifeboats is shown at left, and the boats are painted white.



The anchors, capstan, brass bell, wheel, tackle blocks and rigging cord can all be bought at hobby shops. The chain used should be 32- or 36-link painted black.

Masts and yards. Make the masts of birch or maple and the yards of black walnut or other dark wood, as the *Sovereign*'s yards were black. You can use dowels, sanded to a taper, or shape the pieces as shown in the photos.

The heads of the lower masts and heels of the upper masts are all squared off to fit in the tops, caps and crosstrees that splice the mast sections together. Cut the tops, caps and crosstrees from 1/16" plastic or hardwood veneer, drilling all holes for masts, shrouds, lower-yard trusses, futtocks, halyards and lifts. The delicate caps should be made oversize, then drilled before trimming to final shape.

Starting the rigging. Begin at the bowsprit, mounting the chain bobstays and shrouds first, then the martingale, as shown on the full rigging plan. The jib-boom guys are black button thread. The head stays are mounted after the foremast is in place. Give the outer end of the jib boom a coat of orange shellac.

You're now ready to set up the masts. Start at the lower masts, gluing them in place, then slip on the tops and fit the topmasts into these. The lower masts are

[Continued on page 234]

GIFT SUPREME»

FOR THE *Home Handyman*

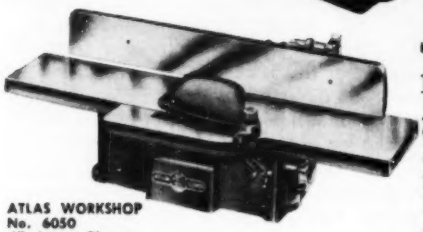
ATLAS No. 6001
6" Jointer-Planer
Ball Bearing
$129.75

you can DO so much MORE so much BETTER

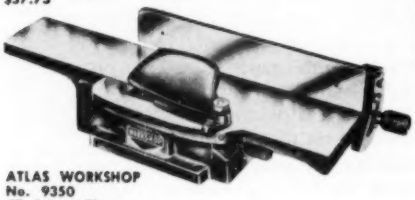
with an *Atlas*

JOINTER-PLANER

If you want him to have America's finest 6" jointer-planer, get him an ATLAS 6001. Greater capacity and accuracy. Solid steel cutter-head-spindle (weighs 10 lbs.) Easily removable for resharpening blades without disturbing blade settings. Grey-iron tables, 42" overall, precision ground to .005 tolerance. Sealed-for-life ball bearings. Many exclusive superiorities. Also available in 4" ball bearing and 4" bronze bearing models. Use coupon for FREE literature and name of nearest franchised ATLAS dealer.



ATLAS WORKSHOP
No. 6050
4" Jointer-Planer
Ball Bearing
$57.75



ATLAS WORKSHOP
No. 9350
4" Jointer-Planer
Bronze Bearing
$31.50

ATLAS makes machine tools for America's leading industries. This same precision goes into ATLAS woodworking power tools. Your assurance of plus-quality in circular, band and jig saws, drill presses, lathes, sanders, shapers is the ATLAS rame. Write for illustrated catalog.

ATLAS PRESS COMPANY
1225 N. Pitcher St., Kalamazoo, Mich.

Please send selections I have checked:
☐ Woodworking Power Tool Catalog. FREE
☐ 20-PLAN BOOK 50c ☐ 18-PLAN BOOK 50c (65c outside U.S.A.)

Name_____
Address_____
City and State_____

FREE CATALOG WRITE TODAY

"DO-IT-YOURSELF"
WITH THESE LOW-COST, PRACTICAL
PLAN BOOKS

1. **20-PLAN BOOK** — original furniture designs by noted authority. 50c
2. **18-PLAN BOOK** — outdoor equipment woodworking projects. 50c

SOLD ONLY THROUGH FRANCHISED ATLAS DEALERS

Hobbyist's Delight

Nicholson X.F. Swiss Pattern Needle Files

Greatest little tools for making things fit—work—look the part of expert craftsmanship! Whether it's a mechanical toy, metal decorative piece, clock repair, or model of your inventive brainchild, these ingenious hand instruments are just the thing for taking "bugs" out and putting neatness or operating smoothness in.

Nicholson X.F. (meaning *Extra Fine*) Swiss Pattern Needle Files come in 12 assorted shapes for performing most any delicate filing operation. They're as accurately made as many of the fine instruments themselves that professionals turn out.

Have you thought about an unusual Christmas gift—for Junior, say, or for yourself? Ask your hardware or industrial supply store for this neat orange-and-black plastic-cased kit.

For very helpful 48-page FREE BOOK, "File Filosophy," write to us.

NICHOLSON FILE CO.
19 Acorn St., Providence 1, R. I.
(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON FILES FOR EVERY PURPOSE

World's Fastest Clipper Ship

[*Continued from page 232*]

painted white to the caps, and the topmasts orange shellac from the caps up.

Setting up the shrouds. These are black cord about 1/32" in diameter for the foremast and mainmast and a bit smaller for the mizzenmast. The shrouds are made in pairs. Run a length of cord from below the channels on one side, up through the top and around the mast, then back down on the same side. The next pair goes on the opposite side, and so on until there are three pairs on each side. The ends of these are tightly secured to tiny pins driven into the hull below the channels. The backstays run through the same channels and are fastened to similar pins.

The ratlines that form the footholds for climbing the rigging are No. 50 mercerized cotton, woven in and out across the shrouds and spaced about ¼" apart. Put a spot of glue at each end shroud to hold the ratlines in place and snip the excess cord off close.

When all lower shrouds are on, slip on the topmast yards, mount the crosstrees and begin rigging the topmast shrouds. These are of slightly lighter cord than the lower shrouds and are threaded on as a single piece. Start at the head of the topmast and run the cord down between the crosstrees, through the first hole in the top, through the hole in the lower mast, up through the hole in the other side of the top, back up to the crosstrees and down again to the second hole in the top, and so on until you have three shrouds on each side of the mast.

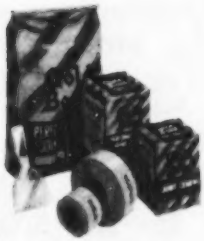
Now repeat the process for the topgallant masts, fitting their heels into the crosstrees, slipping on the upper yards and setting up the shrouds in the same way. The spreaders for the backstays are 1¼" needles tied to the stays with their points pushed under the shroud loops on the crosstrees.

Running rigging. These lines are ecru instead of black. Use No. 60 crochet cotton for the lower and topsails, No. 50 thread for the upper yards.

The topsail halyards have a ⅝" double block at the top and a single one at the bottom with a hook. The following sketch shows how the blocks are rigged. The topgallant halyards are similar except that they have a single block at the top and are anchored to the opposite side of the deck. The royal halyards have a single block at the top and none at the deck staple. The

[*Continued on page 236*]

It's easy to finish walls smoothly with Gold Bond Tape Joint Kit!



Conceal wallboard joints for a better decorating job. Do it yourself!

1. Apply Cement. Smooth flowing channels formed by special *tapered edged* Gold Bond Gypsum Wallboard permit easy, uniform application.

2. Embed Tape. Gold Bond Perforated Tape combined with joint cement binds panels together...adds strength to finished wall.

3. Sand Smooth. Gold Bond Joint Cement dries quickly and evenly... needs only light pressure to level smoothly with wall.

4. Ready to Decorate. Seamless walls provide a "perfect" decorating job with either paint, wallpaper or textured finish.

Whether you're remodeling or building, the best way to get smooth, handsome new interior walls is to make the job 100% Gold Bond! Use sturdy, fireproof panels of Gold Bond Gypsum Wallboard. Finish joints and nailheads with the Gold Bond Tape Joint Kit...available in small, regular and large size packages at your local Gold Bond dealer.

NATIONAL GYPSUM COMPANY • BUFFALO 2, N. Y.

Fireproof Wallboards, Decorative Insulation Boards, Lath, Plaster, Lime, Sheathing, Roofing, Siding, Wall Paint, Textures, Rock Wool Insulation, Metal Lath and Sound Control Products.

MAIL THIS COUPON TODAY!

NATIONAL GYPSUM COMPANY, Dept. PS-123, Buffalo 2, N. Y.

Please send me a free copy of Gypsum Wallboard Application Instruction Folder.

Name .....

Address .....

City ..... *Zone* ..... *State* .....

NO. LP500

TURNER

LIQUEFIED LP PETROLEUM

TORCH

WITH

DISPOSABLE FUEL TANK

Here is a really fine tool of exceptional quality . . . one that you'll find handy, clean, ready and easy to use for soldering, light brazing, hobbycraft work, dozens of do-it-yourself jobs around the house! Never requires filling . . . you just replace entire fuel tank (they're available at your dealer) as needed. Has *all-brass burner and fittings,* I.C.C. approved heavy-gauge large-diameter tank, pressure relief valve, wide-range positive-control flame adjustment. Tank measures 2-7/8" diameter x 9-9/16" high; fits conveniently in tool box or pocket. Tell your favorite Santa Claus — now — that you want this Turner LP Torch. Remember, too, it's a wonderful gift item for you to give a friend. Visit your dealer today . . .

LOOK...SPECIAL ACCESSORIES, TOO

$6.95 COMPLETE
Replacement Fuel Tank $1.95

SEE YOUR DEALER

THE TURNER BRASS WORKS

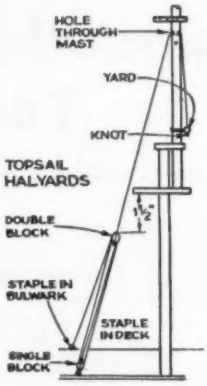
SYCAMORE, ILLINOIS

Since 1871

World's Fastest Clipper Ship

[Continued from page 234]

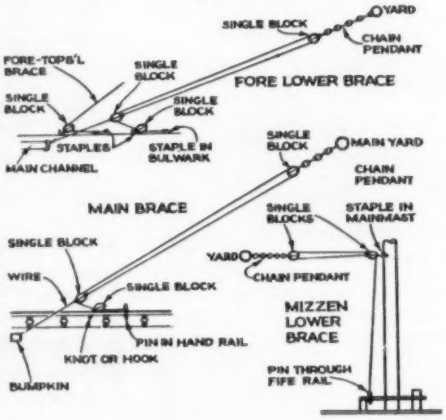
skysail halyards have no blocks at all and come directly to staples in the bulwarks.



The lifts, used to keep the yards level, run from holes in the ends of each yard to the mast. The upper ones go directly to the mast, while the topsail lifts run over the lower cap.

Rigging the braces. These are the tackle that turn the sails to catch the wind. The lower braces run from the yards to points on the bulwarks or fife rail, as shown below. The other braces run through blocks on the masts before reaching the deck and are shown in dotted lines on the rigging plan. All braces have ⅝" single blocks, and the lower braces have 2"-long chain pendants leading from the yards.

The spanker-boom sheets and topping lifts have two single blocks each. The lower sheet blocks are fastened to staples in the deck and the topping-lift blocks to the after



edge of the mizzen top. The throat halyards have two single blocks, the peak halyard a double block on the cap and a single one on the gaff.

Lash your anchors to your bows, hoist your colors, and your completed *Sovereign* is ready to set sail. END

MANY ITEMS JUST RELEASED!

GOV'T SURPLUS and BARGAINS

SHOP BY MAIL AND SAVE

FREE WINTER EDITION

1953 CATALOG, 52 PAGES, chuck-full of unsurpassed War Surplus Equipment Bargains for farm, home, factory and workshop. Every Item is unconditionally guaranteed. You save on everything! Write today.

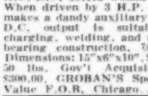
AC-DC ELECTRIC GENERATOR

ITEM #317

Built to rigid U.S. Navy Air Force specifications. Rated A.C. output: 120 volts, 1200 watts, 10 amps at 800 cycles. D.C. output: 60 amps at 24 volts. Use A.C. power source for house trailers, lights, portable electric tools, and A.C.-D.C. series wound electric motors. When driven by 3 H.P. gasoline engine, makes a dandy auxiliary light plant. The D.C. output is suitable for battery charging, welding, and marine use. Ball bearing construction, ¾" spline shaft. Dimensions: 15"x6"x10". Shipping Weight: 50 lbs. Gov't Acquisition Cost Over $300.00. GROBAN'S Special Value F.O.B. Chicago **50.00**

D. C. GENERATORS

ITEM #91



—Type R-1, rated 300 Amps. — 30 volts. Mfd. by Jack & Heintz. Gov't. Acq. Cost $380.00. Shpg. wt. 55 lbs. Dimensions 16"x 10"x7". F.O.B. Chicago **35.00**

Item #90—Type P-1, rated 200 Amps.—28 Volts, 2500 RPM. Mfd. by General Electric, Ford, Delco-Remy and Westinghouse. Gov't. Acq. Cost $300.00. Shpg. wt. 55 lbs. Dimensions 15"x9" x6". F.O.B. Chicago.... **22.50**

CENTRIFUGAL PUMP

Brand New

ITEM #130

GENERAL MOTORS —ALLISON

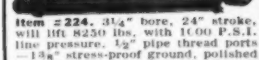
200 GALLONS PER MINUTE

- For Draining Basements
- Fire Fighting
- Irrigation
- Fuel Transfer
- Swimming Pools
- Home water Systems
- Dewatering

For high volume commercial, home and industrial use. Standard 2½" pipe thread inlet, twin 1¼" pipe thread outlets. Ball bearing supported ¾" shaft. Easy priming. Rotation, counter-clockwise facing shaft. Gov't. acq. cost $145.00. Complete with full instructions. Ship. wt. 35 lbs. F.O.B. Chicago **39.50**

Will deliver 200 gals. per min. against 65 foot head using 5.2 H.P. at 3500 R.P.M.

EXTRA HEAVY DUTY DOUBLE ACTION HYDRAULIC CYLINDER



Item #224. 3¼" bore, 24" stroke, will lift 8230 lbs. with 1000 P.S.I. line pressure. ½" pipe thread ports —1⅜" stress-proof ground, polished & plated solid steel shaft. Overall length closed 36". ¼" steel wall cylinder barrel clevis mounting at base and shaft. Features—Tie Rod construction. Honed barrel. Ship. wt. 50 lbs. F.O.B. Chicago **39.60**

NOW . . . SAVE $161.00 on this

$250.00 VALUE — 350 WATT A. C.

PORTABLE ELECTRIC LIGHT PLANT

Compact Electric Plant suited for small homes, cabins, campers, hunting and fishing camps, trailers and small electrical home appliances. Operating costs: About 5c per hour. Runs exceedingly quiet. Sturdily constructed for dependable service. Net weight only 88 lbs. Can be carried from place to place, or transported in trunk of car.

ITEM #176

350 Watt—110 Volt—60 Cycle—A.C. Model—M.S. 35-3, made by Midco Mfg. Co. 1 Cylinder, 4 Cycle Engine complete with muffler, starting rope and oil bath air cleaner, direct coupled to a 350 Watt Generator with voltage control rheostat and twin outlets. Engine speed 1800 R.P.M. Shipping weight 116 lbs.

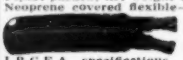
COMMERCIAL LIST PRICE $250.00

NOW ONLY ..... **89.00** F.O.B. Chicago

PORTABLE POWER CABLES

Manufactured By General Electric & Western Electric

Item #193—Ideal for radio equipment, grounding cables, power tools, battery chargers, electric generator sets, searchlights flexible jumpers and general power supply. Individually export packed, net weight 120 lbs., gross 190 lbs. Neoprene covered flexible—2 conductor, 1/0 wire size. Each cable is 75 feet long, and equipped with 1-male and 1-female Hubbell plug. Conforms to requirements of Federal Bureau of Mines and I.P.C.E.A. specifications.

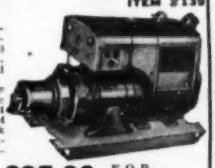


Regular price $135.00 **Per 75 feet** **47.50** F.O.B. Chicago

ELECTRIC POWER

For Your Home or Farm

ITEM #139



Ample current for both 110 volt appliances such as oil burners, refrigerators, deep freeze, lights and 220 volt electric stoves, water pumps, heaters, etc. Connect into standard Edison 3-wire circuits.

7.5 KW—120/240 Volt—60 Cycle A.C.—Single Phase. Master Electric Company generator powered by a 4 cylinder air cooled, Wisconsin V-4 gas engine, magneto ignition, crank start. 19.5 HP @ 1800 R.P.M. Control panel has voltmeter and rheostat. Shpg. wt 825 lbs.

Formerly $895.00

SLASHED TO ..... **695.00** F.O.B. Chicago

HYDRAULIC SPEED REDUCER

WITH FINGERTIP CONTROL

ITEM #115

USE FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Cream Separators • Garden Tractors • Pumps

Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Use input power of ¼ to 1½ H.P. This Westinghouse-Oil Gear Unit consists of a variable displacement hydraulic pump feeding a fixed displacement hydraulic motor. Adjustable relief valves set at factory for 100 inch pounds of torque may be reset up to 180 inch pounds. Independent reverse control allows full output power and speed selection in either direction of rotation. Shafts measure ⅝" diam., include keyway. Input rotation is counter-clockwise facing shaft. Recommended input speed not to exceed 750 R.P.M. Over-all dimensions, 7½"x7½"x11½". Gov't acquisition cost $428.00. Shpg. wt. 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago **54.50**

PESCO GEAR TYPE HYDRAULIC PUMP

COMPACT — POWERFUL — RELIABLE

ITEM #160

Especially designed for belt drive from fan belt, power take-off, drive pulley, electric motor or small gas engine. Equally suitable for direct coupling. Pedestal type mounting with two bolt holes for ⅜" bold-down bolts. Standard ½" pipe thread inlet and outlet ports. Delivers 4.5 GPM at 1000 PSI at 2800 RPM with 3 HP. Will actuate one item #6, 3" bore, 24" stroke cylinder in 10 seconds. Hardened steel gears turn in dense oilite bronze bearings. Rotation—clockwise facing shaft. Guaranteed trouble-free service. Ship. wt. 6 lbs. F.O.B. Chicago **22.50**

D.C. ARC WELDER

NEW MODEL 353

ITEM #65 For Stationary or Portable Use. HEAVY DUTY RANGE to 250 AMPS.

Ideal for
- Farm
- Garage
- Factory
- Workshop

Welds Anything From Auto Fenders To Tractor Frames

- Dial Type Rheostat Control
- Use 1/16" to 1/4" Rod
- Generator-type Welder
- Reactor Coil for Smooth Even Arc
- Use 7½ H.P. Electric Motor or 10 H.P. Gasoline Engine
- Run at 2500 R.P.M.
- Available with Either Flat Belt or Double V Pulley
- Complete Operating Instructions

Shipping wt. 107 lbs. $350.00 Value.

Standard Model F.O.B. Chicago **99.50**

Deluxe Model—with "Magic Terminal" for low amperage range welding. (Between 30-100 amps.) F.O.B. Chicago **119.50**

FOUR-WAY, OPEN CENTER CONTROL VALVE

ITEM #126

with built-in adjustable relief valve. Factory set at 1000 P.S.I., spring loaded neutral position, for use with one double acting cylinder. In neutral position cylinder is locked and pump unloaded. Fully balanced plunger type, smooth, positive, easy operation. Can be used as single unit or mounted in series of any combinations desired. Has ⅜" pipe thread inlet and outlet, ½" pipe thread cylinder ports. Newly manufactured to our specifications. Ship. wt. 8½ lbs. An outstanding buy! F.O.B. Chicago..... **21.50**

Brand New—DOUBLE ACTION HYDRAULIC CYLINDER

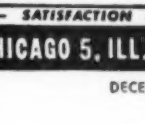
ITEM #355—2½" bore and 7½" stroke, 1½" stainless steel piston rod. Lift capacity 5000 lbs., using 1000 lbs. pump pressure. Manufactured by Delco-Remy Division of General Motors Corporation. Clevis mounting on base and piston rod for 7/16" bolt. Overall length closed 21". Distance between centers 19". Supplied with fittings to ⅜" pipe thread. Brand new—in original carton. F.O.B. Chicago

16.00

ITEM #355A—Same unit, but supplied with built in spring to provide cushion effect on power stroke and rapid return. F.O.B. CHICAGO **17.00**

CONTINENTAL "RED SEAL" 1½ H.P. ENGINE

ITEM #97—Power for lawn mowers, garden tractors, pumps, generators, compressors, fillers, rakes, plows, feed mills, milking machines and motor scooters. Brand new Continental "Red Seal" 1½ H.P. gasoline engine, Model AA-7, single cylinder, 4 cycle, with 6:1 gear reducer. Shipping weight 60 lbs. A $74.00 value. Order now. Limited quantities. F.O.B. Chicago **47.50**



ORDER DIRECT FROM AD — SEND PAYMENT OR PURCHASE ORDER TODAY — SATISFACTION GUARANTEED

TO PLACE PHONE ORDERS • CALL WEbster 9-3793

GROBAN SUPPLY CO. 1139 SO. WABASH AVE., CHICAGO 5, ILL. DEPT. PS-12

PALMGREN
HOBB-E TOOLS

ROTARY INDEX MILLING TABLE

Turn drill press into vertical miller. Mill, Grind, Index. Rabbet, Mortise and Rout curved or straight. PALMGREN "Hobb-E" ROTARY TABLE is a precision machine, accurately graduated. Bolts to table. No. 83—8" Table, 4" Cross Feeds, 360° Rotary Feed..... **$54.50**

No. 83

No. 82—Without Rotary Feed..... **$39.75**

ANGLE VISE

Set up hard angle jobs in 5 seconds. Drill, grind, mill, round, square or irregular pieces quickly and accurately. Save time, money and errors. PALMGREN ANGLE VISE has 2½" Jaws. 1 Plain, 1 Grooved. Accurately machined and graduated. No. 000 Angle Vise. **$11.75**

No. 000 ANGLE VISE 2½" Jaw—Opens 2½" Mounted on Swivel Base

Complete with Swivel Base

MILLING ATTACHMENTS

Mill it on YOUR LATHE! Now! You can make T-slots, Dovetails, Keyways—Recess, Grind, Square Shafts, Saw at Angles, etc. Fits any Lathe. Graduated for rotary and vertical feeds. Attaches to tool post in 10 seconds.

No. 150—1½" Jaws. Fits 1" Post..... **$18.75**

No. 250—2½" Jaws. Fits 1¼" Post..... **$24.75**

No. 400—4" Jaws. Fits 2" Post..... **$39.75**

No. 250

ADJUSTABLE ANGLE PLATE

Every Hobbyist should have one for jobs difficult to hold in vise. No delay, less spoilage on complicated angles in drilling, milling, grinding or layout work. No. 256 B has 6"x6" surface plate, 8 bolt slots. Adjustable to full 90°. Accurate graduations. Mounted on Swivel Base. **$14.35**

No. 256B

No. 249B—9"x9½" Plate Mounted on Swivel Base.. **$32.75**

BENCH DRILL PRESS VISE

A fine "Hobb-E" tool. Base bolts to work bench for general work. Vise is dovetailed and removable for use on drill press by loosening thumb screw. Unit rotates 360° horizontally. Adapter has steel jib which locks vise in position. No. 12 Removable Jaws 2½" wide. 1 Plain 1 Grooved. Only..... **$12.95**

No. 12

Write for Circular No. 201 S.

ORDER NOW! SEND COUPON TODAY!

CHICAGO TOOL & ENGINEERING CO.,
8366 South Chicago Ave., Chicago 17, Ill.

Enclosed find_____for items checked below.
☐ PALMGREN "Hobb-E" ANGLE VISE. ☐ PALMGREN "Hobb-E" ANGLE PLATE ☐ PALMGREN "Hobb-E" ROTARY TABLE. ☐ PALMGREN MILLING ATTACHMENT. ☐ PALMGREN "Hobb-E" BENCH DRILL PRESS VISE. ☐ Send Circular No. 201 S.

NAME_____

ADDRESS_____

TOWN_____ZONE_____STATE_____

Gus Rides with Santa Claus

[*Continued from page 180*]

had been rubbing for a long time against the main battery lead to the starter button. Finally, under Knute's heavy braking, it had been worn through to the bare copper, producing a dead short.

The battery might or might not be capable of taking and holding a charge now. The plates might be too buckled for service. Gus taped the wire, shoved it clear of the brake-pedal arm.

Gus Chews on the Problem

He straightened, fumbled out his pipe with fingers that were stiff with cold, absentmindedly poured in tobacco that was swept away by the wind, while his mind chewed on the problem. The truck would run on the generator if they could get it rolling fast enough for a husky charge. But the vehicle sat at the bottom of a steep grade, facing a steep upgrade.

"Here," Knute's voice came out of the blackness of the night, "I have a better light than your little one, Gus."

A broad beam emanated from Knute's hands as he spoke, and Gus saw that he had one of those camp lights that are powered with two telephone batteries. Hmm, thought Gus, here were four volts. Would a six-volt ignition system start an engine on four? A car battery with one dead cell would start an engine if it was cranked by hand, even when too weak to turn the starter.

Quickly Gus stripped wire from the taillight lead and tied the two telephone batteries into the primary ignition circuit, while Knute held the pencil light on the work.

"Now, Knute," he said, "we'll turn her over."

Knute's Crank Is 100 Miles Away

"By yimminy, Gus," Knute said sadly, "I ain't got no crank. Feller next door borrows my crank and my yack—he goes for yuletide a hundred mile." And as if in explanation of the loan, he added, "What poor, raggedy tires that feller had."

"Oh, Lord," Gus groaned. To himself he muttered, "Better start carrying holly, Knute."

Knute's thin, weather-seamed features were centered in the beam of Gus's pencil light. Looking into the faded, blue eyes,

[*Continued on page 240*]

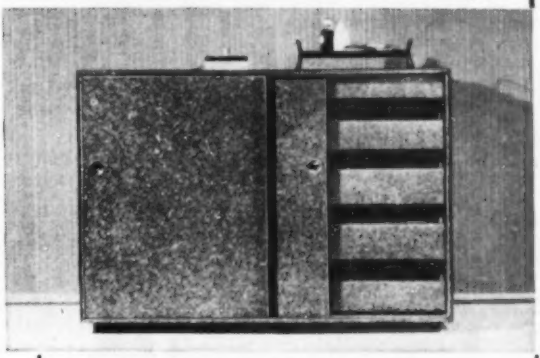
She'll love this "YOURS and HERS" wardrobe

It's easy to make with

NOVOPLY®

Handsome . . . functional . . . yet all materials cost less than ½ price of ready-made Cabinet. This rich looking wardrobe made of California Redwood Novopiy is the modern way to keep clothes neat. Has loads of hanger space behind sliding door, pull-out tie rack and 5 see-in drawers. Send for Easi-Bild* Pattern No. 139 ($.60) which lists materials needed. Simplified step-by-step directions for cutting and assembling. Build It Yourself Patterns take the mystery out of building.

*T. M. REG. EASI-BILD PATTERN CO.



Weldwood **Novoply by**

Weldwood®

UNITED STATES PLYWOOD CORPORATION

World's Largest Plywood Organization

Weldwood Building, 55 West 44th St., New York 36, N.Y.

U. S.-MENGEL PLYWOODS, INC.

Louisville, Ky.

United States Plywood Corporation PS-12-53
Pattern Department, P.O. Box 215
Pleasantville, New York

Enclosed please find 60¢ for pattern No. 139. ☐

Enclosed please find 35¢ for 32-page pattern catalog illustrating over 200 different projects. ☐

NAME.....

ADDRESS.....

CITY.....STATE.....

with a

NORTON® INDIA® Gouge Slip

The gouge has a curved edge and requires a stone formed to fit the curve. Rotate the gouge from side to side as illustrated. Then turn the stone over and using the narrow end give the inside of the gouge a few deburring strokes, keeping the inside face flat on the stone. Get FS-76 at your hardware store or direct, $2.25.

Are the rest of your tools sharp? If not, send 10¢ for the "How to Sharpen" Book to Behr-Manning Corp., Troy, N. Y., Dept. PS-12. C-6

BEHR-MANNING®

▲COATED ABRASIVES ▲SHARPENING STONES ▲PRESSURE-SENSITIVE TAPES

Get what you want...and...save dollars, too...

SEND--TODAY--FOR THIS

Hunt's

BIG, NEW WOODWORKERS CATALOG NO. 20

144 pages of bargains. New, low, money-saving prices. Finest selection of domestic and imported hardwoods--all kinds, all properly kiln dried.

ONLY 15¢

QUICK DELIVERY

Maple, mahogany, red cedar, oak, cherry, poplar, walnut, and many others --all properly seasoned...and ...kiln dried.

Like thousands of woodworkers all over the U.S.A.--you'll get what you want and save money, too--with this famous book. Filled with everything you need.

Shows 32 rare and fancy woods in color.. 275 scroll patterns... multicolor inlays, overlays, bandings...ornaments...moldings...hardware...tools...and...pages of information, tips, ideas. Send for your copy-- right now. Only 15¢ -refundable on first order.

MAIL TODAY

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. B-12, Chicago 8, Ill.

Send me the big, new, money-saving Catalog No. 20. Enclosed is 15¢--refundable on my first order.

Name.....

Address.....

City.....Zone.....State.....

This is a Syncro Electric Jig Saw

It's a Complete Unit in Itself. You can carry it home under your arm, set it on a table or workbench, plug it in, and proceed to work on it.

Now this blade gives you 14,400 smooth strokes per minute, just about 5 times as fast as the ordinary jig saw blade. It is especially well suited to delicate fret saw work and it always cuts that smooth edge that requires no sanding. This last feature alone will save you many hours of time which you would ordinarily spend sanding such things as what-not shelves, magazine racks, fern stands and the many other things that you will like to make.

You will find that all the forests of the world are right at your elbow to provide you with rare and beautiful materials for your handicraft. But even with that, you are not limited to wood. Plastic materials are now appearing in a large variety of colors.

For instance, catalin, a molded plastic. It is comparatively easy to work on this jig saw and takes a beautiful polish. Not quite so easy to work, however, as bakelite. Bakelite, for a cast plastic, is hard and brittle and the ordinary saw cuts kind of a splintered or split edge on it. But the high speed and the fine teeth in these Syncro blades always insure a clean cut. You will find that these various plastic materials are particularly nice for working out such things as monogram pins, belt buckles, picture frames and wall lamps.

Now comes the best news of all. Parents especially are glad to know that here is a power jig saw that is safe also for boys and girls to use. Accidental injuries on this machine, even the slightest cuts, are very rare. Serious injuries are impossible. Now that may seem strange to you but the reason is very simple . . . the Syncro blade does not "pull" the "work" or finger towards it as belt-driven jig saw blades do.

If you happen to have seen a Boy Scout Troop doing handicraft metal work, you will always find a jig saw one of their main tools. Perhaps you have various ideas that you would like to work out in metal; a name plate out of aluminum, a shadow lamp out of copper, or book ends out of brass. You can do all these things on this same machine using the same one blade to cut all those different types of metal, as well as wood, cardboard, etc.

And remember that you can do all these things without a great deal of expensive equipment. Actually with only one machine—one jig saw and one blade—one saw you can carry home under your arm, plug it in and go to work on it.

It comes complete with 6 blades and there is nothing else to buy. No belt, no pulley, no motor, or anything else. It is all complete (including built-in motor) in this one unit. The built-in power unit is also guaranteed against burn-out all during your ownership or is replaced free. Syncro is a precision-built, UL-Approved, durable tool, and will last a lifetime. Syncro electrical precision products have been made for 30 years. Your hardware dealer should have one on display.

However, if he is out of stock or no store is near you, send only $24.95 direct to Syncro Corporation, Dept. G-123, Oxford, Michigan, and your Syncro Jig Saw No. 201 will be shipped to you postpaid. Use it 10 days, then if it does not please you 100%, return saw postpaid to Syncro and your money will be promptly refunded. Or send postcard for Free Circular of Syncro Saw and Syncro Sanders.

100%

Gus Rides with Santa Claus

[*Continued from page 238*]

Gus saw a man's faith in him die. Knute Hansen had never expected to see a stalled vehicle that Gus Wilson couldn't start.

The wind was howling now. Snow stung their faces. Gus's tiny light was reflected from the blade of an axe, thrust in the side of the pickup, beside the holly.

"Wait, Knute," he cried. "You've got an axe and you're handier with it than a grease monkey."

"By yimminy, Gus," Knute complained, "you been running a yoke on old Knute. I know all along you start my truck easy."

It wasn't easy. It was hard, cold work, up there among the snow-laden trees in the darkness, cutting down a tree that Gus had selected and trimming it of branches. Together they got it down to the pickup truck. Using the tree trunk as a pry, they finally managed to hoist a rear wheel.

Gus Turns the Motor Over

With the motor in gear, Knute in the cab manipulating gas and choke, Gus turned the engine over by spinning the wheel. Gus was cold. His hands were half frozen. Would those four volts be enough?

Never in his life before had the sound of a starting, sputtering engine sounded so good to Gus. He catapulted into the cab, shoving Knute aside. He slapped the truck out of gear, keeping the engine turning over fast enough to throw a full output on the generator. They sat there a long time, while the heater brought them warmth. Then the truck started crawling through the snow, over the mountain.

When, at long last, they drove down the short, single street of Highland, it seemed to Gus that every door in the town burst open in greeting. Folks gathered about the truck, heedless of the storm, women with snow-sprinkled shawls about their heads, bearded men grinning.

"Merry Christmas, Knute!" they chorused. And it seemed to Gus that the time-honored greeting took on a new and deeper meaning. END

On Their Own

A GANG of road repairmen had forgotten their shovels and phoned their foreman.

He replied: "I'll send the shovels out on another truck. Just lean on each other until they get there."—*Fireman's Fund Record.*

Tell her you want MILLERS FALLS TOOLS for Christmas

Clean-cutting and beautifully balanced planes.
No. 9 Smooth Plane (9") **$8.25**
No. 14 Jack Plane (14") **$9.00**
No. 75 Block Plane **$3.00**

Cuts most anything — most anywhere. Steel, wood, plastics, BX, etc. No. 725 "Nest of Saws". **$2.95**

Power-full help on countless jobs. Drills, sands, grinds, polishes, buffs, etc. No. 1814 ¼" Electric Drill. **$22.35**

Sand and polish with any ¼" electric drill. No. 2120 Buffing and Sanding Attachment with 5" rubber pad, 5" lamb's wool bonnet and two 5" sanding discs. **$8.45**

New Right Angle Drive for ¼" electric drills. Makes it easy to work in corners, between studs, in hard-to-get-at places. No. 2130. **$4.95**

For doing work fast. Speedy way to drive screws, bore small holes. Complete with 2 screw driver bits, 3 drills. No. 29X Screw Driver. **$3.85**

No. 100 Automatic Drill for one-hand operation. Fast, accurate. 8 drills in indexed handle. **$4.40**

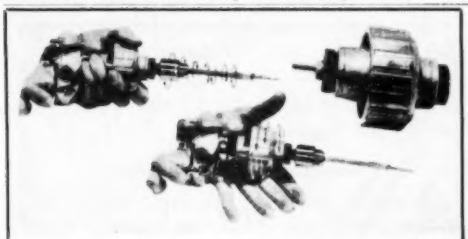
No. 106 Carving Tool Set. 6 razor-keen tools in most useful cutting shapes. **$4.80**

Swivels and locks at any angle. Jaws open to 2¼". Clamps to benches up to 2" thick. No. 18 Swivel Vise. **$4.50**

In gift-wrap boxes at your hardware dealer's

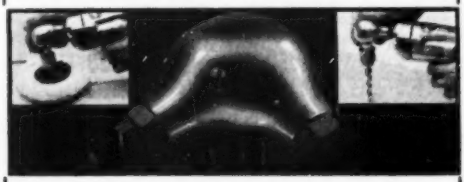
MILLERS FALLS TOOLS
SINCE 1868
The Mark of Superiority

MILLERS FALLS COMPANY, Greenfield, Mass.



Babco 5-to-1 Speed Reducer Fits ¼" Drills

Convert your ¼" electric drill to electric screwdriver—drill holes to 1¼" in wood, ½" in masonry. Planetary gear system gives tremendous torque increase. Adapters furnished to use ¼" or ½" chuck. Instant starting, stopping with hand clutch control. To operate tool grip reducer, release to stop. $9.95 ppd.



Babco Right Angle Drive for ¼" Drills

Close coupled, fits on drill spindle. Remove chuck, attach to angle drive. Twice drill speed for sanding or half for polishing. Easy to drill in close spaces. $4.95 ppd. Heavy-duty angle drive for ½" elec. drills $19.95 ppd. At hdw. stores and tool dealers or from Babcock Mfg. Co., 6259 Claremont Ave., Oakland 18, California

5 BIG POWER TOOLS IN ONE
FACTORY TO YOU $79.95

Only SUPERSHOP can offer you a complete precision-built workshop for $16 per tool. 100% Ball Bearing. Lifetime accuracy. Rugged frame of heavy steel tubing. Handles big jobs. 8" saw. Sold direct from factory to save you $65.05. FREE trial. Easy pay plan. Free Catalog.

Write for FREE Catalog

POWER TOOLS INC. 254 YATES AVE. BELOIT, WISCONSIN

Quit driving an oil-burner—get new piston rings!

Oil pumping is just the start of expense and trouble—the first danger signal from worn-out piston rings. The longer you let those old rings stay in, the more oil you'll use, the more power you'll lose, and the bigger your repair bill will be!

As your engine gets older, it runs hotter because of accumulations in the cooling system. The cylinders wear tapered and out-of-round—need more oil on the walls.

It requires a special type of piston rings—replacement rings—to deliver this extra oil, under full control, without waste.

Hastings makes replacement rings exclusively, devotes all its research on the highways and in the laboratory, to the particular replacement problems of each make and type of engine.

That's why Hastings Rings *stop* oil-pumping, *check* cylinder wear, *restore* engine performance—in re-ring, re-bore and re-sleeve installations.

So go to your motor specialist at the first sign of oil-pumping or performance drop-off. If rings are the trouble, ask him to install a Hastings Steel-Vent replacement set. Truly the best money you can spend on your car! Hastings Manufacturing Company, Hastings, Michigan; Hastings Ltd., Toronto; Piston Rings, Spark Plugs, Oil Filters, Casite, Drout.

HASTINGS

STEEL-VENT PISTON RINGS

Regular or Chrome

Tough on Oil-Pumping
Gentle on Cylinder walls

Fastest Freight Train

[*Continued from page 143*]

Argentine's icer is the mightiest of them all. It is a giant called "Rube Goldberg" by Santa Fe employees. It runs on its own ground-level tracks, takes orders by wireless radio and radio-telephone signals sent through its main power lines, and can ice an empty 65-car train in as many minutes.

Its armlike chutes have already started gesturing over our dusty steel cars. High up on the machine's control platform, its operator presses a button and turns a pointer. Ice by the ton crashes down into the first car's head bunker.

The wheel crew is also hard at work, and soon a black-and-white switcher growls in and starts rearranging 62.

The one reefer bound for St. Louis has to be set out and shunted over to the Wabash line. Since it is 11 cars up from the caboose, that means a little maneuvering. But that's all right, because the entire train has to be taken apart and re-formed for delivery into Chicago. The 19 cars to be taken over by Indiana Harbor Belt and delivered to the various eastern railroads must be at the rear of the train. The four others, bound for Chicago, will be immediately behind the engine.

Cars Rearranged in Seven Moves

In seven switches, the little yard engine has the job done. Meanwhile our new power has rolled up. Its 4,400-horsepower combination revs up, sings a little and moves in reverse to pick up its work for the night.

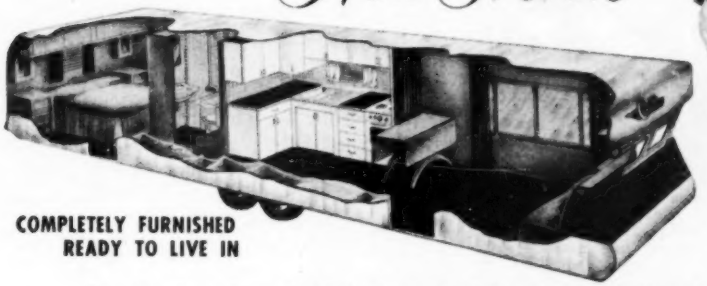
In a few minutes we're on the Kansas City Terminal right of way. We gain a little speed, clack and rattle across the maze of switches and frogs behind Union Terminal. The station's main control tower has cleared us across its boards of winking colored lights.

At 5:35 the next morning, the Mississippi, gray and cold, slides under us. Only the prairies and long hills of Illinois lie between us and our destination. We hit 60 and stay there.

[*Continued on page 244*]

CAREFREE LIVING?

sure is—in our *New Moon*



COMPLETELY FURNISHED READY TO LIVE IN

From its plane stress chassis to its weathertight roof, a New Moon home is tops in built-in comfort. Its thick blanket of insulation, the piano hinges on its doors, the triple trapped enclosed plumbing, its custom cabinet work with mortise and tennoned joining—these are but a few of the many features that make living in a New Moon "carefree." Write for your copy of "Adventures In Living" and learn other advantages.

New Moon Homes, Inc.

FORMERLY REDMAN TRAILER CO., ALMA 38, MICHIGAN

Stars of Philip Morris Hit TV Show "I LOVE LUCY"

SELECTED AS AMERICA'S OUTSTANDING MOBILE APARTMENT HOME *to be featured in*

Starring **LUCILLE BALL AND DESI ARNAZ in "THE LONG, LONG TRAILER"**

M-G-M's New Technicolor Hit! (TO BE RELEASED SOON)

The World's Most *USEFUL* Hand Tool!

What a budget-priced MAN'S gift — the handiest tool he can own! A squeeze of the hand locks jaws onto work with Ton-Grip! Won't slip. Bends, pulls, turns, twists, ratchets, HOLDS. A whole tool kit in one trim tool! 7" and 10", with or without cutter, only $1.85 to $2.60, at your hardware dealer

FREE "HANDYMAN'S GUIDE"—Write for this handy, fully-illustrated guide to easier, faster fixin'.

PETERSEN MFG. CO., Dept. P-12, DeWitt, Nebr.

For work-free masonry drilling

Use new **CARBOLOY** *"LIVE-SPIRAL"* **Masonry Drill**

Even drills concrete like wood!

Now . . . rotary drill any masonry in your home with ease! New Carboloy "Live-Spiral" Masonry Drills bite cleanly through brick, slate, tile, concrete or cast stone. Won't stick, stall, bind.

Super-hard carbide tip gives extra-long use. Lets you drill holes at **any** angle . . . to bolt down washer, dryer, tubs . . . fasten hooks, screens, awnings, trellises . . . attach bath, kitchen fixtures, partitions, furring strips, etc.

Get "Handy-Man" Kit today. Contains 3 "Live-Spiral" Drills: 1/4", 3/8", 1/2". Fit 1/4" chucks. $6.65 per kit. Send coupon, or see your hardware dealer.

"Carboloy" and "Live-Spiral" are registered trademarks of the Carboloy Department of General Electric Company

MAIL THIS COUPON TODAY

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

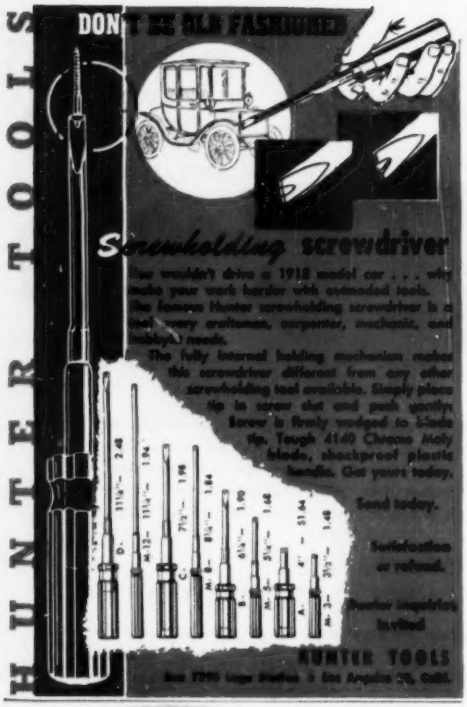
11173 E. 8 Mile Street, Detroit 32, Michigan

☐ Send me ___ Handy-Man Kits at $6.65 per kit, postpaid. ☐ Enclosed is check or money order for _____. ☐ Send C.O.D. ☐ Send me free folder.

Name _____

Address _____

City _____ Zone ____ State _____



WEEK-END DECORATORS!

Peel off old paint

FOR A BETTER JOB

Why try to paint over a cracked, checked or broken finish . . . when it's so easy to "peel it off" with Klean-Strip? This modern remover leaves the surface clean, smooth and dry — ready for a better, longer-lasting paint job. Non-inflammable Klean-Strip works fast on all type finishes. Needs no afterwash or neutralizing . . . saves labor and materials. Buy it when and where you buy paint.

Made by The Klean-Strip Co., Inc.
2340 S. Lauderdale, Memphis 6, Tenn.
KLEAN-STRIP TAKES OFF ANY FINISH

Fastest Freight Train

[*Continued from page 242*]

But then something is unexpectedly moving. Like a small sun, far behind us, an amber disk seems to be jerking around the bends we've already passed. Then on a long straightaway it grows larger.

Our conductor says it's the Chief, famed Santa Fe streamliner, and in a moment it leaps past us, going at least 90 miles an hour. It will beat us into Chicago by an hour and a half.

Automatic Train Control is now helping run 62. Above and to the left of the engineer's head, with a glass window facing him, is a metal box about a foot high and three inches square. One just like it faces the fireman. This is the ATC signal, and it gives primary control of trains not to their engineers but to the ATC system.

Gives Speed Warnings

When an engineer is rolling his train along, he may have nothing but green semaphores ahead, but if he should inch over the speed limit that ATC is set for, he will get red boards, colored warning symbols on the ATC signal, and blasts from a warning whistle in the cab.

From here on in, we get a whole series of warning signals and keep having to damper our speed.

"Something ahead's sure poking along," grumbles the engineer.

Santa Fe could bring this train through several hours faster, but they leave plenty of slack toward the end because emergencies and delays like these frequently crop up.

Soon, though, we are able to slow for good, wheels grinding as we enter the long Chicago yards on a bright Sunday at noon, 2,195.6 miles from our starting point. END

Perfect Record

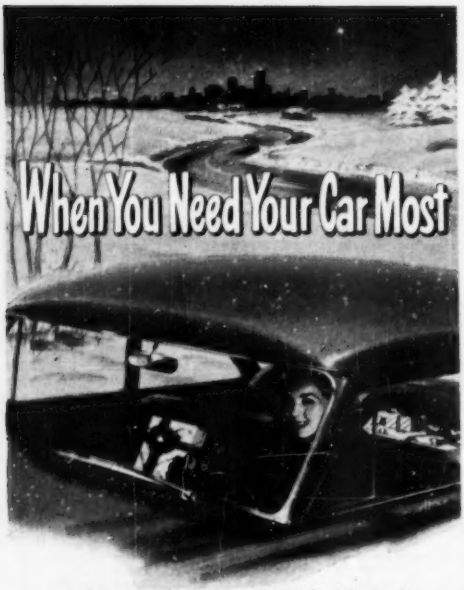
"How many successful parachute jumps does a man have to make before he graduates?" asked the recruit.

"All of 'em," the sergeant replied.—*The Wyatt Way.*

SHOPMASTER'S SENSATIONAL
universal
POWER TOOL
with RADIAL ARM
Here's a complete workshop for the hobbyist or woodworking craftsman—all in one tool. Easy to convert . . . simple to operate, it's precision-built to finest professional quality. All moving parts glide on ball bearings. Tools lock in any position. The most versatile and useful all-purpose woodworking power tool ever developed!
Circle Saw. Mitres, compound mitres, cross-cuts, dados, rips, cups, grooves.
Drill Press. Drill, rout or mortise at any angle within any radius, in 36" circle.
Sander. Locks in vertical or horizontal position or at any angle.
It's a circle saw, drill press, sander, router, shaper, lathe
All in one
(slightly higher in zone 2) $269.95 LESS MOTOR
EASILY MOVED
All-steel stand tilts back on casters for easy moving.
SHOPMASTER, INC., Room 11Fo
1214 3rd St. So., Minneapolis, Minn.
Send information on new Shopmaster Universal Power Tool TODAY!
Name
Address
City State

" THOUSANDS OF USERS SAY "
HANDIEST SMALL PARTS CABINET
SO CONVENIENT IN HOME, SHOP, OFFICE
ONLY $5.95
FOR 16 DRAWER UNIT
ALL METAL
32 drawers (96 compartments) 15¼ in. x 12¾ in. x 6 in.
16 drawers (48 compartments) 7¾ in. x 12¾ in. x 6 in.
Drawers — 1¼ in. x 2¾ in. x 5⅞ in.
Just the cabinet to store those hundreds of small items such as nails, screws, nuts, stamps, hobby needs, fishing lures and flies, assembly components, etc. Ideal for gifts, too. Gray baked enamel finish, welded steel, aluminum drawers, rubber feet. Shipped postage prepaid — 32 drawer unit, $9.95; 16 drawer unit, $5.95. Satisfaction or your money back. Add 3% sales tax for Ohio orders. Checks or money orders—no C. O. D.'s, please.
MANUFACTURED BY PERKINS PRODUCTS, INC.
170 E. MARKET STREET ALLIANCE, OHIO

World's Outstanding
MICROSCOPE BARGAIN!
Lifetime Christmas Gift
$9.95 postpaid complete
MODEL 300—100, 200, 300X, triple revolving turret microscope with cabinet, handbook-manual, prepared and blank slides—all inc. at 9.95 ppd. Years of adventure at a never-equalled price.
HOBBY SUPPLY CATALOG
FREE! All materials to make your own slides, larger microscopes, 44 pages. Inc. with your order or mailed on request.
MODEL 600—150, 300, 600X, standard type $29.95.
MODEL 800—75, 150, 300, 600X, prism type $39.95.
10-DAY MONEY-BACK GUARANTEE
Send check or M.O. for Christmas delivery. Calif. resid. add 3% state tax.
AKRON
63 Akron Bldg., 4379 Sunset Blvd.
Los Angeles 27, Calif.



. . . when the last friendly light blinks far behind, and you don't know how many miles it is till the next, it's good to know that your car has a rugged, dependable, steady-feeding fuel system.

You Can Depend on This

CARTER

LIFELINE

THE FUEL PUMP to insure fuel supply

THE FILTER to clean the fuel

THE CARBURETER to meter the correct fuel mixture for your car engine

To give your car CARTER dependability, see your nearby CARTER dealer. His address is listed in the yellow pages of your phone book.

CARTER CARBURETOR CORPORATION
St. Louis 7, Missouri
Division of American Car and Foundry Company

Games Disclose Secrets of Success

[*Continued from page 128*]

have heard to the contrary, top-ranking mathematicians say that there is no system that can safely be applied to any of the games of pure chance.

But where skill also is involved, the sort of calculation that students of the subject have worked out produces solutions to problems like this:

Two men have agreed to fight a duel with revolvers; each is to have three shots. They are to stand 100 paces apart and at a signal start walking toward each other. Each man can start firing whenever he pleases. The problem for you, if you were one of these duelists, is: how far shall I walk before I start shooting? If you start too soon, your bullets are likely to go wild. If you start too late, your opponent may have shot you before you have pulled the trigger.

Students of the science of games are able to answer this question, provided they know how good is the marksmanship of each duelist.

Jet Fighters Get Electronic Advice

This may seem like a waste of time, since not many people fight duels any longer. But in fact it has great and immediate importance. American jet fighters now approach the enemy in the sky at about the speed of sound, which means that the two planes come toward each other at approximately 1,400 miles an hour. The question when to start shooting is a life-and-death matter. Since at such speeds the human brain can hardly arrive at the proper decision, calculations of the Von Neumann type are fed into an electronic computer in the plane, which comes up with approximately the right answer in a fraction of a second. END

As the Twig Is Bent

Children are
What parents mold them;
Small wonder then
That parents scold them.
—*The Right Hand.*

DO MORE PLANING JOBS WITH LOW COST BELSAW

Exclusive MONEY-MAKING features:

- Full 12¼ in. x 6 in. capacity
- Power feeds at 24 ft. a minute. (Easily adjusted for lower feed rate)
- Machined cast iron bed; adjustable rolls, total bed length 42 in.
- Provides for Grinding Knives in the Cutterhead.
- Attachments for Jointing, Rabbeting, Tongue, Groove, Matching.

Belsaw Multi-Duty Planer for cabinet shops, builders, lumber yards, woodworking plants and spare time work shops... Now you can convert low cost rough and random size lumber into high priced cabinet finished stock... Easy to make flooring and popular patterns. Belsaw quickly returns cost with savings on raw material... profits on finished stock.

LOW DOWN PAYMENT EASY TERMS

Send Today for FREE literature on Belsaw, the LOW COST, high speed production planer.

BELSAW MACHINERY CO

1023 Field Bldg. • Kansas City 11, Missouri

KING MIDGET AUTO

Operate it for 75c per week. Amazing performance. Surprising comfort. All steel construction. Ready to run or assemble it yourself with our bolt together parts. Rider Agents wanted. Send 25c for detailed literature or $1 (refunded first order) for actual assembly book and service manual filled with photos, drawings, specifications, etc.

MIDGET MOTORS MFG. CO., ATHENS, OHIO

The QUICK-WAY to SHARPEN CIRCULAR SAWS

The complete sharpener, featured in FORTUNE and other leading magazines. Anyone can use . . . guarantees precise grinding and spacing of teeth. Operates on your own power table. Complete with patented Index Plate, facing block for mitre and $3.00 grinding wheel—no extras needed. Sharpens circular saws up to 12" diameter. Saves time and money.

Send check, cash or money order. We pay postage.

Model 6-12P
$16.50 *Postpaid*

QUICK-WAY Saw Company
13 Riverside Corning, N.Y.

Easier Metal Repairs

FREE Illustrated Booklet, "Soldering Simplified." 16 pages of how-to-do-it! Get your copy.

Kester Solder Company
4254 Wrightwood Avenue, Chicago 39, Illinois

THESE Starrett® TOOLS BELONG IN EVERY KIT

Starrett gives you perfect design and finish plus exclusive features you just don't find in other makes. Buy the *best* — buy *Starrett*.

AUTOMATIC CENTER PUNCH No. 18

An automatic, adjustable stroke punch — no hammer needed. 3¾, 5 or heavy duty 6" models.

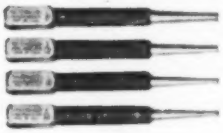
STARRETT SCRIBERS

No. 70 Pocket type with reversible point, non-roll hex head.

No. 67 Straight, short bent and long bent points interchange in knurled stock.

No. 800 NAIL SETS

Easy to hold, easy to hit, won't roll. Five point sizes from 1/32 to 5/32".



DRIVE PIN PUNCHES

No. 248 Extra long for deep holes. Five sizes from 1/8 to 3/8". Short types for heavy work.

SEND FOR IT — ONLY 10¢
Starrett "Tools and Rules" Book

50 page booklet shows the right tools for any precision measuring job. 100 pictures plus helpful reference tables. Send only one dime. Address Dept. PS.

THE L.S. STARRETT COMPANY · ATHOL, MASS., U.S.A.

STARRETT TOOLS — Starrett — SINCE 1880 · WORLD'S GREATEST TOOLMAKERS — Buy THROUGH YOUR INDUSTRIAL DISTRIBUTOR

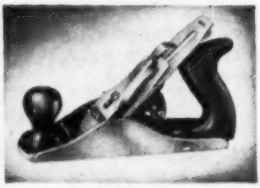
MECHANICS' HAND MEASURING TOOLS AND PRECISION INSTRUMENTS
DIAL INDICATORS • STEEL TAPES • PRECISION GROUND FLAT STOCK
HACKSAWS, BAND SAWS and BAND KNIVES

"Suburban" Set No. 981—Knotty pine chest holds 34 tools—for handyman or hobbyist. $99.50. Other chests and sets from $25.75.

When your family or friends ask what you want for Christmas, tell them *Stanley Tools*! You know *Stanley Tools* are practical and they'll give years of service.

STANLEY TOOLS are designed to please experts, yet are priced for the handyman. Only a few of the wide selection are shown here.

Bench Plane No. 4—Better Plane for Better Work. Perfect balance—cutter fully adjustable. $8.25.



Nail Hammer No. 51½—Balanced for easy driving. Beveled claws grip and pull nails and brads easily. $2.90 (*Western price slightly higher*)

INDIVIDUAL STANLEY TOOLS AVAILABLE IN GIFT BOXES

"Pull-Push" Rule No 1208W—Large black numbers on 8 ft. white blade. Tops for Christmas stocking. $1.19.

"Yankee" Push Drill No. 41—Push to drill holes in wood or plastic. Chromium plated. 8 drill points in handle. $5.65.

"Yankee" Handyman Spiral Screw Driver No. 233H—Drives and draws screws easier, faster—also drills small holes. Rugged ratchet construction. $4.75.

STANLEY TOOLS
New Britain, Connecticut

THE TOOL BOX OF THE WORLD

STANLEY TOOLS

STANLEY®

HARDWARE
ELECTRIC TOOLS
STEEL STRAPPING
STEEL

Infrared Rays Clarify Bible Texts

[*Continued from page 90*]

against Rome, and the date of that revolt was 132-135 A.D.

By far the richest find, however, was made by the Bedouins in a cave not more than half a mile away from the one they stumbled upon in 1947. American scholars are inclined to agree with Harding that this find is more important than even the spectacular one of six years ago, even though the manuscripts are not nearly so well preserved.

Scrolls Contain Old Testament Books

For one thing, the new cave has given up many more scrolls or parts of scrolls. So far at least 70 have been identified—among them the Old Testament books of Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Joshua, Ruth, Samuel, Kings, Psalms, Ecclesiastes, Song of Songs, Isaiah, Jeremiah, Lamentations and Ezekiel.

Some of these look older than even the famed Isaiah scroll from the first cave: they may carry us back to the third century B.C., whereas most of the Hebrew texts we now use go back only to about 900 A.D.

This doesn't mean that the new finds are likely to require any great changes in the Bible. In fact, there is every reason to believe that the text of the Old Testament has been handed down, century after century, with amazing accuracy.

Ancient Version Agrees with Modern

For example, the Isaiah scroll from the first cave is a thousand years older than the Hebrew text commonly used, yet the scholars responsible for the Revised Standard Version of the Bible, published last year, found that it was more accurate at only a dozen points, all of them minor. Nevertheless, the only Hebrew texts we have had up to now do contain a number of obscure passages whose meaning translators have had to guess at. Study of the older texts may clarify these points.

[*Continued on page 250*]

BUILD YOUR OWN ARC WELDER OR LIGHT PLANT

D-C GENERATOR

Save $250 to $500

$15.50 used, good cond. Instruc. incl. for Comb. welder & light plant. 200 amps. 28 Volts, 2500 to 4500 R.P.M. Or Brand New, Price **$21.50**

PRICE F.O.B. K. C. MO.

CONVERTS TO ARC WELDER 200-250 AMP. OR LIGHT PLANT CAP. LOAD 5000 WATTS

BEAM ROTATOR MOTOR New Applicable for 110V. A.C. or 24V. D.C. Powerful geared motor for TV aerials, Ham FM antennas etc. Approx. 9 R.P.M. free swing. Instructions incl. Stock #A431. $50.00 value..... **$7.50**

R-1 Gen. 300 Amp. 30 V. D.C. $25.50

115V. A.C. GENERATOR IDEAL LIGHT PLANT & BATTERY CHARGER Stock #511. A.C. output 1250 Watts 115V. A.C. 10.9 Amps. 400 Cyc. D.C. output 200 Amps. 30 Volts. Makes Dependable Light plant for Homes, farms, boats. Use D.C. output for battery charging, Welding, Marine use etc. Instructions Incl. Gov't cost over $300.00. Wt. 50 lbs. Used good condition **$25.50** New **$35.50**

PESCO PUMP For water, Oil, Insecticide, etc. Including built in relief valve. Cap. 400 G.P.H. ½" spline shaft, ¾" pipe ports. Data incl. #6001 ..... **$7.95**

Cuno Oil Filter — Brand New Aircraft type. Filters oil without cartridge replacements. Just turn handle and cartridge is clean. Standard ⅜" inlet and outlet ports to accommodate 14 gallons per minute. STOP CHANGING OIL. Instructions incl. **$4.95** paid post-

RHEO-STAT #R-21 heavy duty recommended for regulating the voltage on the converted electric welder **$6.95** postpaid

Send check or Money order. Prices F.O.B. C. O. D. except when marked postpaid.

GENERAL SALVAGE CO.
DEPT. 107, 2922 E. 27 ST., KANSAS CITY, MO.

SURPLUS SALE

$39.50 Less Grinding Wheel

NEW TOOL POST GRINDERS
REGULAR PRICE $125.00
1-6 H. P. MOTOR
TAKES WHEELS UP TO ½"x4"
EXTRA QUILL EXTERNAL OR INTERNAL $19.50
MONEY BACK GUARANTEE!

EDWARD J. NOLAN, PULASKI, NEW YORK

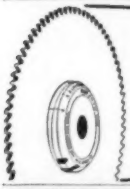
LOOKING FOR THE BEST PLIER TO BUY?

GET

CHAN NEL LOCK

TRADE MARK REG — U. S. PATENT OFFICE

CHAMPION DeARMENT TOOL CO., MEADVILLE, PA.



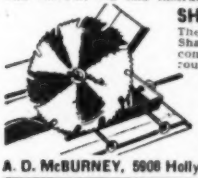
.01" ACCURACY with MAGNA DADO!

Geared hub. Sets in 5 seconds with Allen wrench. Cuts any groove 5/32"-7/8" wide. 2" max. depth. 12-gauge tempered steel blade; 8" dia. Available at SHOPSMITH dealers. Fits most saws, $14.95.

FILE SAWS THE RIGHT WAY

SO EASY: With this new filing jig and jointer anyone can now sharpen any hand-saw like new! When file hits hardened steel rollers teeth are finished and EXACTLY SAME HEIGHT. All teeth cut and saw runs true and smooth. Jig and instructions **$2.95** postpaid. Free literature.

SHARPEN YOUR CIRCULAR SAWS

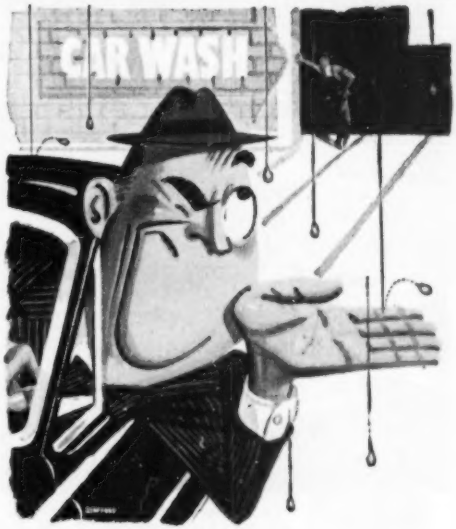


The RIGHT WAY on your own saw table. Sharpens rip, cutoff, hollow ground and combination blades—6" to 10". Saws stay round with correct bevel. Precision made, easy to use. GUARANTEED. Only **$8.95.** Includes $3.00 Grinding wheel. **"TRU-CIRCLE"** saw set automatically sets teeth at 10° or more **$2.95.**

AT DEALERS OR POSTPAID

A. D. McBURNEY, 5608 Hollywood Blvd., Hollywood 28, Cal., Dept. S-36

SELF-CONTROL STARTS HERE



AND TO RESTORE CAR PERFORMANCE

OIL-CONTROL STARTS HERE

To stop oil-pumping, replace worn engine connecting rod bearings

The pleasure of car driving can be thoroughly dampened when worn engine bearings cause oil pumping.

Worn engine bearings let excess oil reach combustion chambers, burn to performance-stealing carbon on spark plugs, valves, pistons and piston rings. *Performance goes up in smoke!*

Don't blame the piston rings for oil pumping caused by worn engine bearings. Give the rings a chance—check for worn engine bearings on every overhaul. Replace with genuine Federal-Mogul bearings, *engineered* for the job of oil control. They'll restore power and performance—*ask your mechanic!*

FEDERAL-MOGUL SERVICE
(Division of Federal-Mogul Corporation)
DETROIT 13, MICHIGAN

CONTROL OIL-PUMPING
WHERE IT STARTS—REPLACE WITH

FEDERAL-MOGUL

OIL CONTROL BEARINGS

New Low Cost HOBART Air Cooled Arc Welder

AC Generator Only for building your own comb. welder-power plant.

For General Repair, Anywhere
You can do profitable general shop and outside repair work at a low investment with the "Husky Boy" 200 amp. arc welder. It's compact, lightweight, is easily portable and has an air-cooled gas engine drive. For inside use, easily attachable wheels and handles are available at a slight extra charge.

AC Welding and AC Power

"Build Your Own" combination arc welder and power unit using this AC-AC generator. Makes a big saving in first cost. Comes complete, ready to hook-up to your gasoline engine, tractor or truck.

Electric Drive DC Welder

Be Your Own Boss!
Cash in on the demand for dependable weldors—start your own business with the Hobart 300 amp. electric drive welder. No other welder on the market can match it for completeness of equipment, economy of operation and welding range. It's a real all-purpose machine.

Hobart Bros. Co., Box P-123 Troy, Ohio
"One of the world's largest builders of arc welders and equipment"

Welding Lessons $1.00

Complete operator's training course. 200 pages, fully illustrated.

HOBART Trade School

Learn welding quickly, easily in this modern, non-profit school. Complete or partial courses. Best equipment, thorough training, experienced instructors. Ask for free booklet.

Enroll Now! G.I. Bill approved

Hobart Brothers Co. Box P-123, Troy, Ohio

Send complete details on items checked.
☐ Husky Boy ☐ Generator Only ☐ Electric Drive DC Welder ☐ Hobart Trade School ☐ Welding Lessons Book $1.00

FREE! ☐ "Weldors Vest Pocket Guide"

NAME _____

ADDRESS _____

CITY _____ STATE _____

Infrared Rays Clarify Bible Texts

[*Continued from page 248*]

Scholars are excited, too, because some of the manuscripts are written not in Hebrew but in a related language called Aramaic. This language was used in some of the later books of the Old Testament. It was also the language spoken by Jesus, and some authorities think that Aramaic, instead of Greek, was used in the original version of parts of the New Testament. Since only a few ancient documents in Aramaic have been found, the new ones are counted on to serve as a sort of textbook leading to a better understanding of the works originally written in that tongue.

Essenes Were Community-Minded

In the Manual of Discipline, found in the 1947 cave, the sect that owned the scrolls referred to itself as *serek hayahad*, which Dr. Millar Burrows, Yale professor and for many years president of the American School of Oriental Research, translates as the Order of Unity. Sects similar to this were known to several ancient, non-Biblical writers as the Essenes, and Pliny the Elder reported that their chief settlement was along the Dead Sea, north of En-Gedi, which is now 'Ain Jidi.

Harding thinks this points fairly certainly to the settlement recently excavated near the scroll caves.

The Essenes gave everything they earned to the community fund. They despised luxury; dressed simply, in white; spent considerable time in prayer and study and in helping others; condemned slavery; and swore to "forever hate the unjust and fight the battle of the just."

Sect May Figure in Old Testament

Is there a relationship between this pious sect and some of the events and teachings recorded in the New Testament? Some Bible scholars have long thought so. They point out that John the Baptist "grew and became strong in spirit," in the words of the Bible, "and

[*Continued on page 252*]

CUTTING GLASS is EASY

Wipe glass clean with clean rag. Get rid of all dirt or film which prevents the glass cutter from making a uniform cut.

Lubricate the wheel of your Red Devil glass cutter using any household oil. This supplies oil to cutter wheel and reduces friction between glass and edge of wheel.

Always make an even, continuous stroke across the whole surface and off the edge of the glass. Never cut twice. Practice cutting scrap glass, first.

To break glass, hold firmly on opposite sides of cut line. Give quick bending motion away from cut, keep fingers clear to cut. Break right after cutting so cut does not get "cold."

EASY as this, if you have the right tools and know how to use 'em.

your . . .

Red Devil

Hardware or Paint Dealer can take care of both these needs. Get full details by getting your free copy of Red Devil's booklet "How To Cut Glass" from your dealer or mail coupon today! Remember—you want Red Devil Tools—the kind professionals use.

Red Devil Tools.
Dept. 803
Irvington 11, N. J.
Please send me "How To Cut Glass"
Name _____
Address _____
City _____ State _____ 3035

SANTA SAYS:

"A WONDERFUL HOBBY WORKSHOP GIFT!"

Cut Perfect Grooves On Your Saw With

Warren DADO SAWING WASHERS

Not One—Not 12 But 40 Different Cuts

Warren Washers—engineered to cut clean, accurate, parallel grooves with your present power saw. 40 micromatic adjustments—just dial the desired width. Strengthens blade, eliminates vibration—leave on saw for straight cuts. No burning or chewing. Over 250,000 satisfied users. Get genuine Warren Washers—they're GUARANTEED!
Arbor sizes ½", ⅝", ¾", 1". See your dealer or write direct.

Send for Free Booklet

WARREN WASHERS CO.

ONLY **$4.95** PER SET

DEPT. 52, BOX 98, NORTH END STATION ✻ DETROIT, MICH.

send for FREE CATALOG

America's Foremost

***money-making* MECHANICS' TOOLS**

It's easy to own the same "pay-off" tools used and endorsed by America's top-earning mechanics throughout the automotive, aviation and industrial fields! Snap-on tools help you handle every repair job faster, easier, better. And they LAST . . . pay for themselves over and over again! Start building your own tool set now with basic Snap-on units—add others any time. Genuine Snap-on tools are never sold in stores—direct to users only. Mail coupon for free catalog.

Snap-on Tools
THE CHOICE OF BETTER MECHANICS

Snap-on Tools Corporation
8060 L 28th Ave., Kenosha, Wis.
Send me free catalog. Occupation _____
Name _____
Address _____
City _____ Zone _____ State _____

WHEN YOU
DO IT YOURSELF
USE GOOD TOOLS

For those 101 jobs around the house, the auto and the yard, *good* tools get the job done faster and easier.

UTICA ® pliers and adjustable wrenches are *good* tools, skillfully forged for rugged strength. And UTICA's own process *extra-hardens* to tools at points of extreme wear.

Ask your dealer for UTICA ® pliers and adjustable wrenches. It will pay you to remember the name—UTICA. ®

UTICA
DROP FORGE AND TOOL CORPORATION
UTICA 4 NEW YORK

IT PAYS TO BUY QUALITY TOOLS
and the world's best tools are made in U.S.A.

NEW TOOL—tilts to any angle
—Many uses that no other vise can give you.

only $7.95
IDEAL CHRISTMAS GIFT

Only vise that pivots to any angle on ball-and-socket, mount and locks quickly and rigidly in position. Ideal for hundreds of uses by hobbyists and around the house. Most practical tool for handling all kinds of small parts and items in shop. Has jaws 2" wide with 2" opening. Sturdily constructed, a permanent tool. Fully guaranteed. Wt. approx. 3 lbs. Jr. Model Price $7.95.

LARGER VISE—same principle of operation—shown at right. Portable for drill press or can be fastened to bench. Jaws 3" wide with 3" opening. **Wt. approx. 20 lbs.**

Sr. Model PRICE $19.95

Postpaid when check accompanies order for either vise.

BELLOWS MFG. CO.
1017 N. Central Expressway, Dallas, Texas

Infrared Rays Clarify Bible Texts

[*Continued from page 250*]

he was in the wilderness till the day of his manifestation to Israel."

The Essenes, too, lived in "the wilderness." Furthermore, some of them, abstaining from marriage, brought adopted children into the order; and it is known that they practiced a rite similar to baptism.

In any event, the next we hear about John, he is baptizing in the Jordan River, which runs not far from the ancient settlement at Qumran, and meeting Jesus nearby.

Scholars Employ Scientific Methods

The newest manuscript finds will take a long time to translate, but the staff of the École Biblique, aided by the staff of the American School of Oriental Research, are going about it imperturbably—placing the hardened bits of leather and parchment in humidors to soften, flattening them on glass, photographing them with infrared light (an expensive process paid for by John D. Rockefeller Jr.), and then matching the photographs.

Scraps Are Treated Gently

They go about it gently, too, for these are precious scraps—and the scrolls they formed may once have been held by men acquainted at first hand with some of the events that took place after "there went out a decree from Caesar Augustus, that all the world should be taxed . . . and Joseph also went up from Galilee, out of the city of Nazareth, into Judaea, unto the city of David, which is called Bethlehem . . ." END

Up in the Air

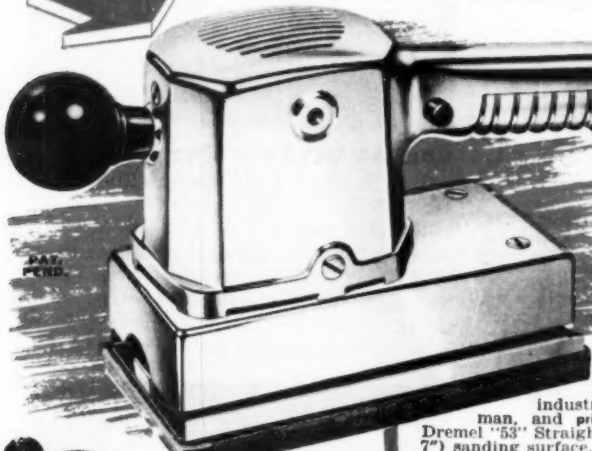
A SMALL boy, left inside the automobile while his mother went shopping, was wildly twisting the steering wheel and uttering roaring, motor-like sounds. An amused passerby smiled on the lad, watched for a while and then advised:

"Sonny, you'd better stick your arm out when you go around corners or you'll get into trouble."

The boy looked up scornfully. "Look," he said, "you stick your arm out of a spaceship and you'll get it ripped off!"—*C & O Tracks.*

NEW DREMEL STRAIGHT-LINE ACTION SANDER

JUST IN TIME FOR CHRISTMAS GIVING!



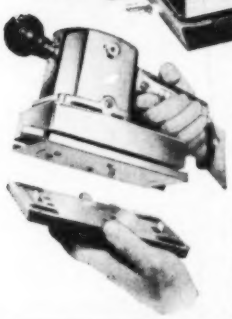
HAS A POWERFUL ROTARY MOTOR!

Complete with two sanding pads, and 6 assorted abrasives. Extra pads $2.75 each.

$34.85

A PROFESSIONAL SANDER AT A HANDYMAN'S PRICE

Here's a heavy-duty sander **built** for the industrial woodworker and professional craftsman, and **priced** for the home handyman! The **new** Dremel "53" Straight-Line Action Sander has 25 sq. in. (3⅝" x 7") sanding surface, weighs only 5¼ lbs., is driven by a powerful **rotary motor** (110 V. 60 cycle AC) . . . 6,900 strokes per minute . . . has no gears, belts, brushes or commutator to wear out and replace. Dremel **Straight-Line Action** guarantees satin-smooth finishes you'll be proud to show. Detachable paper holder speeds up paper changes. Use it for WET or DRY, coarse, medium or fine sanding . . . the Dremel "53" is positively the most versatile . . . the **greatest sander value** in today's market.



LIFETIME SEALED BALL BEARINGS

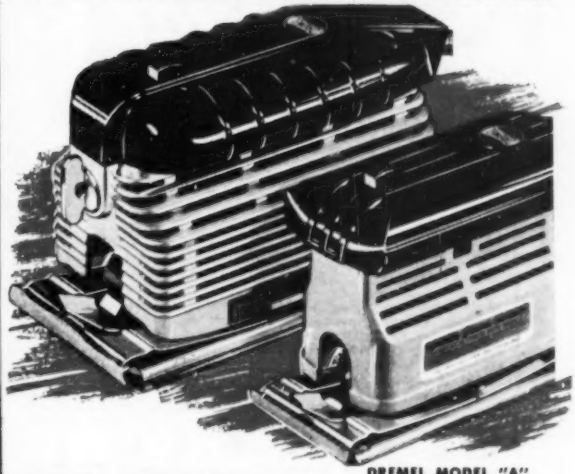
—

EASY ON! EASY OFF!

—

Unique paper holder is detachable. Grits can be switched quickly without bothersome paper change.

THERE'S A DREMEL SANDER FOR EVERY USE



Here's Why Craftsmen Approve . . . Use . . . Only Straight-Line Action Sanding!

Wood fibers lie with-the-grain . . . are directional. Sanding cross-grain is much like brushing a suede jacket against the nap. It leaves marks or "scratches." Sanding with-the-grain is like brushing the suede with the nap . . . leaving a velvet-smooth surface, entirely scratch-free. Shown below are four common types of sanding actions. Only **Dremel** "Straight-Line Action" sands 100% with the grain . . . Only **Dremel** can guarantee 100% scratch-free finishes.

ROTARY (cross-grain) Action	ORBITAL (cross-grain) Action	ARC (cross-grain) Action	DREMEL STRAIGHT-LINE (with-the-grain) Action

SEE YOUR FAVORITE DEALER: Dremel Tools are sold at better dealers everywhere. If your dealer can't supply, order direct on a five-day trial, money-back guarantee. Remit in full, and we will ship postpaid. Or, send only $2.00 now, pay postman balance plus postage and C.O.D. fee.

DREMEL MODEL "2000" SANDER-POLISHER

Perfect for small shop use, home repair, and workshop projects. Choice of craftsmen for fine finishing operations. Features Dremel "Straight-Line Action"; 14,400 strokes per min.; 5 lb. wt., 21 sq. in. (3¾"x5"), sanding surface. **Model "2000" Sander-Polisher, 25 asst'd. abrasives, 1 polish pad in sturdy steel carrying case . . $24.50**

DREMEL MODEL "A" SANDER-POLISHER-MASSAGER

Lighter capacity model, a favorite for general home maintenance, hobbycraft, furniture polishing, etc. Effective body massager. Features Dremel "Straight-Line Action." Wt. 2½ lbs.; 12 sq. in. (2¾"x3¾"), sanding surface. **Model "A" Sander-Polisher Massager, 6 abrasives, 1 polish pad, 1 massage pad $14.85**

DREMEL MANUFACTURING COMPANY, Dept. 123-M, Racine, Wisconsin

Give the Best...WISS!

for all sheet metal cutting

WISS Metal Master Compound Action Snips

#M-3 Easily cuts 18 gauge sheet metal. Cuts curves and circles as well as straight. Ideal for the home workshop. $4.25. Rubber grips recommended, 60¢ extra.

WISS "Hy-Power" Pruners

#908 Pruning shears cut easily and cleanly. Non-pinching pistol grip handles. Soft anvil keeps knife blade sharp indefinitely. Choice of professionals. $2.50

WISS Combination Snips

#V-13 Solid steel, with gray japanned handles. Cuts curves and irregular shapes with ease. Handy pocket size. 7" long. Accurately tempered jaws and strong bolts. $1.85.

Prices slightly higher Denver and West

WISS NEWARK, N.J.

Quality for more than a Century

J. WISS & SONS CO. • NEWARK 7, N.J.

FREE BOOKLET

Your Guide to Speedy Accurate LEVELING

Send for your free copy of "ON THE LEVEL," a booklet that tells you how to handle every type of leveling job speedily, easily, accurately and economically with the new, amazing LEVELALL.

Learn how LEVELALL operates on the principle that "water seeks its own level." . . . how you can level points all alone . . . how easy it is to handle and use the transparent plastic tube, shut-off valves and mounting brackets . . . why LEVELALL is better and quicker than a transit . . . how LEVELALL pays for itself quickly by saving time and costs . . . and how satisfied customers praise this precision instrument.

Send for the booklet and get the facts . . . then you'll want a Deluxe LEVELALL . . . only $12.95. Better yet, take advantage of our money-back guarantee and order your LEVELALL now. Dealer inquiries welcome.

L E V E L A L L

LEVELALL 81-N Webster St., Rockland, Mass.
☐Please send free booklet, "On the Level." ☐Mail me Deluxe LEVELALL @ $12.95 ☐Regular 50' model at $9.95 ☐Ship postpaid full price enclosed. ☐Ship C.O.D.

Name_____

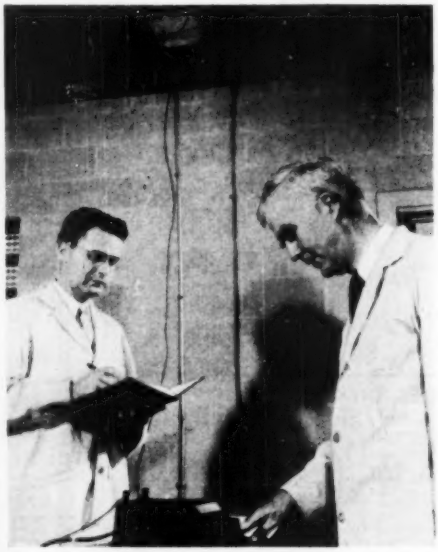
Street_____

City_____Zone_____State_____

[In Canada, prices slightly higher; write LEVELALL, INC., 5465 Decarie Blvd., Montreal, Que.]

English Get Four-Door Bantam

THE Standard Eight above is the cheapest four-door sedan made in England. Stripped of nonessentials—like hub caps and bumper braces—it sells abroad for about $1,350. The trunk is reached from inside the car and the rear seat folds forward when not in use, for more storage space. A four-cylinder engine drives car up to 62 m.p.h.



How Good Is Your Insulation?

HEATING engineers can now measure the effectiveness of insulation with a new heat-flow meter in much the same way photographers measure light intensity with an exposure meter. The meter has a foot-square plate of thermocouples that indicate electrically the rate of heat flow into or out of a wall or ceiling. Shown in use at the Zonolite Co.'s laboratory, it was developed by R. G. Huebscher, L. F. Schutrum and G. V. Parmelee of the American Society of Heating and Ventilating Engineers.

GIGANTIC SAVE-TO-70% **MAIL SALE** WAR SURPLUS EXCESS INVENTORY BANKRUPT STOCK

BURDEN PAYS ALL SHIPPING CHARGES

POWER PLANTS & GENERATORS

Note: all AC plants are 115-v 60-c.
- Plants 25 KW A-C.....$1190
- Plants 5 KW A-C.....$531
- Plants 3 KW A-C.....$349
- Plants 2 KW A-C.....$289
- Plants 1 KW A-C.....$189
- Plants 3 KW 115-v D-C.....$169
- Plants 1.5 KW 32-v D-C.....$72
- Plants .6 KW 32-v D-C.....$64
- Gener. 3 KW 115-v A-C.....$149
- Gener. 2 KW 115-v A-C.....$139
- Gener. 1 KW 115-v A-C.....$104
- Gener. .6 KW 115-v A-C.....$79
- Gener. 3 KW 115-v D-C.....$49

Save to 70%—See our catalog

WATER PUMPS & SYSTEMS

- Centrifugals ¾", $19.95; 1", $29.85; 1½", $38.60
- Rotary. Bronze-nylon roller. Self priming. Pressures to 100 lbs. ½", $17; ¾", $24; 1", $32.
- Auto Water System. Lifts to 22 ft. 110-v 300 gals. per hr. 40 lb. pres. Compact. Easy to install.....$70

Gauges, valves, couplings, hose, etc. Free advice.

SUPER CLOSEOUT BARGAINS

- Winch, 1500-lb. cap. 1-4 ratio...$19.95
- Mechanics Tool Chest, deluxe...$19.75
- Gas Chain Saws, leading make...$199.00
- Foot Lockers, Army type.....$12.65
- Rural Magneto Phones.....$9.95
- Weed Spray Outfits, 7-row ($200 cost).....$130.00
- Tarpaulins, finest Army 10 oz. 8x10'.....$8.80
- Tarpaulins, all sizes 10 oz.....11c sq. ft.
- Engineers Boots, Reg. $14.....$8.76
- Electric Drill, ¼" 110-v.....$26.95
- Electric Drill, ¼" 110-v.....$16.89
- Emergency Air Unit, tank, hose, etc. $14.95
- Hi-Spd. Hand Grinders, 19-pc. 110-v $14.50
- Revolver, 9-shot RIR .6" $28.95

Hundreds items, many less than mfg. cost.

WATCHES—OPTICAL—PRECISION UNITS

Fully guaranteed tax-paid top-quality (leading makes—Save to 50%)!
- Binoculars, 7x50 coated with case...$42.95
- Binoculars, 8x25 coated with case...$29.75
- Microscope, 3-turret 100-200-300X....$9.95
- Engineers Hand Level with case.....$5.84
- Surveyors Tripod Level & Rod.....$37.95
- Weather Unit, barometer, hygrometer, thermometer.....$12.50
- Car Altimeter, 0-10,000' (Taylor).....$9.00
- Wrist Watch, 17-jew. "Executive" Emcor.....$18.15
- Engnr. Stop Watch, precision 1/10 sec. $12.95
- Inspection Magnifier, 2"x4" lens.....$2.89
- DeLuxe Auto Compass, Illum. type..$5.49
- Hand Tally Register, records 9999...$4.95
- Drawing Sets, finest 13-pc. in case...$9.78

HYDRAULIC EQUIPMENT

Savings to 80%. Build loaders, diggers, presses, etc. Marvelous values.
- Pump, 1000 lb. 12 gal. 500 RPM $45.50
- Cylinders, 1-way 3"x8" $11.95; 2-way 2"x10" $22.85; 2-way 3"x24" $39.90.
- Valves, hand control, 1 or 2-way..$18.00
- Gauges, 1000 lb., 1500 lb. or 2,000-lb.....$3.49

Many other items—see our catalog.

AIR COMPRESSOR UNITS

Paint, clean, for tires, control termites, etc. Build your own or ready built units.
- DeLuxe Kit. Tank, compresr, gauge, valves, paint gun, regulator, fittings, etc. "How To Build" instr. $70 value..$45
- Economy Kit, same, smaller tank, no regltr, paint gun.....$32
- Components, Compressors, $20. Tanks $5.79. Auto. Press. Switch $4.95. Gauges (160 lb.) $1.89. Pop-Off Valve $1.95. Paint gun $9.95. Dust Gun $1.29.

Many air items, see catalog.

SPECIAL For The Month! ELECTRICAL PHYSICS LAB. KIT

- Ten-piece experimental kit. Conduct hundreds of fascinating instructive experiments in home laboratory. Keep abreast of our atomic age.
- Consists of hi-voltage alternating current hand generator, electro-magnetic super-strength unit, burglar-fire alarm, magnetic control, multi-contact relay, capacitor, resistors, experimental instructions and plans for home laboratory. Orig. cost over $35.00. Prepaid in U.S.A. ..... Only $6.99

EXTRAORDINARY SURPLUS BUYS!

Quantities are limited so order promptly!

ARMY PANTS CLEANER

- Amazing air-solvent cleaner. Makes dirty greasy parts shiny bright in secs. For garages, factories, farm, etc. 105 lbs.
- Heavy galv. tank 25x20x20". Air jet valve, hose, hyd. lid. Cost over $1000...Ppd. $29.95

Generator—3000W—115V

- Dir. Current ball brg. compound-wound Delco unit. 1" shaft drive 2800 RPM. Ideal for portable tools, lights, boats, etc. Guar. List over $100. Prepaid.....$49.50

AIR CORPS SEARCH LIGHT

- Famous Grimes hi-intensity light, 4 signal filters, 5 Mile beam. 6-v DC or AC, widely used by police, boats, farmers. In case with ext. cord. Cost over $30. Prepaid.....$4.39

ORDER FROM AD or write for big **FREE CATALOG** 1000s of items! Motors, sporting goods, hand and electric tools, clutches, clothing, watches, tarps, winches, etc. Write for your copy of Free Catalog—today!

OUR 30-YEAR POLICY • Everything guaranteed to satisfy • We pay all shipping charges in U.S.

BURDEN SALES COMPANY
834 "O" ST. LINCOLN, NEBRASKA

NEW, EXCLUSIVE
LOK·BLOK
LOCKS BLADE IN HANDLE

Now **TWIST & IMPACT PROOF!**

Plus many other great features and unsurpassed quality...yet cost no more than ordinary drivers!

At All Leading Dealers

UPSON BROS., INC., Rochester 14, N. Y.

Pat'd.

HOLD-E-ZEE
The Original
Automatic Grip
SCREWDRIVERS

OVERHAUL YOUR MOTOR *in 10 minutes*

STOP BURNING OIL, STOP PISTON SLAP
15,000 Mile Performance Guarantee!

1st Step—CLEANSE WITH "MOTOR PURGE"—In the FIRST step of the famous Motor Renew Kit treatment, the "Purge" formula cleans, quiets and frees rings, valves and pistons from efficiency and power robbing carbon, gum and varnish. Pour this miracle solvent into the cylinders, run your motor and watch the combustion residue billow out of your exhaust pipe.

2nd Step—RENEW WITH "COMPRESSION SEAL"—RESTORE COMPRESSION . . . GET NEW POWER, SPEED AND ECONOMY with "Compression Seal"! As the SECOND step of the Renew treatment, squeeze this self-expanding mineral compound into your cylinder where it can fill worn spots (which cause compression leaks) between cylinder walls and pistons. Thus is restores compression . . . cuts oil-gas waste and eliminates costly engine overhaul and ring jobs.

100% MONEY BACK GUARANTEE!

Free Auto Manual with each order. Kit treats all cars and trucks.
$6.95 Postpaid (or send $1 deposit, bal. C.O.D.)
WRITE "RENEW KIT," Dept. PSN-12
10407 W. Washington Blvd., Culver City, Calif.

BUILD YOUR OWN POWER TOOLS—WITH GIL-BILT PARTS KITS

PLANS only $1.00 EACH POSTPAID

Exclusive GIL-BILT Build-It-Yourself Features
- No machining—build easily with hand tools only
- No blueprint reading—step-by-step pictorial plans, full scale patterns, actual photographs
- Sturdy wood, aluminum and steel construction
- Capacity and performance of commercial saws selling for $60 and up
- Proved performance. Nationally advertised and sold for 6 years. Satisfied customers around the world.

GIL-BILT 10-in. TILT/ARBOR SAW

- 27x28 in. table, 13½ in. capacity in front of blade
- 10 in. blade cuts 3½ in. deep, tilts full 45 degrees
- Floor model 34" high, table always stays level
- New Departure ball bearing arbor, ¾" precision shaft turned down for ⅝" bore blades, alum. housing, chinned ready to run.
- Jackscrew and 4½ in. dia. handwheel lowers and raises blade
- Cast aluminum miter gauge and self-aligning rip fence guide

GIL-BILT Metal Parts kit includes Plans, ball bearing arbor, miter gauge and bar, rip fence guide, dado insert, bed knobs, jackscrew mechanism and handwheels and all other metal parts (less blade).....$22.95
Same Kit with 10" Combination Blade $25.90
Same Kit with 8" Combination Blade $24.90

GIL-BILT 12-INCH BAND SAW

- Cuts to center of 24 inch circle
- Handles stock up to 6 inches thick
- 18x18 inch table tilts 45 degrees
- Lower wheel and drive pulley runs on sealed New Departure Ball Bearings. Upper wheel runs on two ⅝" bore Oilite Bronze bearings
- Upper wheel tension and tilt mechanism of cast aluminum, completely assembled
- Upper and lower blade guides. Each has ball thrust bearing, self-lub bronze jaws
- Rigid cast aluminum wheels fully machined ready-to-install. Heavy rubber tires
- Uses standard 78 inch blades up to ¾ in. wide
- Fully enclosed mechanism for utmost safety

GIL-BILT Metal Parts kit includes Plans, rubber tires, aluminum wheels, ½ in. blade, ball bearing spindle, tilt mechanism, blade guides, table tilt segments, and all other metal parts.....$23.95

Return Kits in 10 days for refund if not satisfied.
For shipments up to 600 miles, add 5% over 600 add 10%. Amount in excess of actual postage will be refunded.

Order Kit now, or order Plans at $1.00 each and Kit later less cost of plans. Write for **FREE** Catalog.

ALSO AVAILABLE: Plans & Parts Kits for 18-in. Band Saw, Belt Sander, 8-in. Tilt-Table Saw

GILLIOM POWER TOOLS P. O. Box 1-VM, Lambert Field St. Louis 21, Missouri

Life-long

10 YEAR BATTERY*

A EUROPEAN INVENTION

Gives 2,000 Amps Instant Power Output

A WINTER AND SUMMER BATTERY

Actual tests and records prove that below zero conditions or boiling temperatures have no effect on the electric recuperative power of this famous Battery.

BETTER THAN GOVERNMENT SPECIFICATIONS

Life-Long Batteries (same type as used by the U.S. Army, Air Force and Navy Submarines recently were proven to be better than Government requirements. For example: A production Life-Long Battery for passenger car use was submitted to strict U.S. Army Signal Corps tests for use in the Arctic weather. Life-Long out-performed all tests, even delivered power at a temperature 20 degrees further below zero than was necessary.

SPECIAL LIFE-LONG FEATURES

Silver Nuclear Cells; Galvic Grids; instant starting in any type of weather; non-corrosive lead bushing on terminal; acid-proof silver-locked plates with capillary action for safety; Uncalcined metallic bearing litharge; self-levelling device controls low-gravity electrolyte; micro-calibrated cell connectors; measured resistance safety fuse; requiring least amount of water; approved by insurance companies.

SELF-RECHARGING

Unequaled life expectancy and outstanding recuperative characteristics of LIFE-LONG Batteries make it possible to sell at the popular price of—6 volt, $29.95; 12 volt available for $34.95.

LOWEST PRICE FOR QUALITY!

Life-Long, the only Battery with a Ten-Year Guarantee.* It pays you to change it to your new car. Figure the difference. Check the quality . . . the performance. Hundreds of testimonial letters prove Life-Long Battery to outperform, outlast others by over 300%. . .

SPECIAL DEALER AND DISTRIBUTOR ZONES AVAILABLE

LIFE-LONG BATTERIES, 6V and 12V, are manufactured for all cars, trucks, boats and industrial use.

LIFE-LONG BATTERY MFG. CO.
11766 W. Pico Blvd. Dept. P-12
Los Angeles, Calif.
San Francisco, Chicago, Cleveland, Dallas

LIFE-LONG BATTERY CO.
11766 W. Pico Blvd., Los Angeles, Calif.
Please ship LIFE-LONG BATTERY at once:
6 volt ($29.95 including tax)
12 volt ($34.85 including tax)
for _____
Make & Model, Year of Car
☐ I enclose cash, check, or money order; you pay shipping cost.
☐ I enclose $5 deposit, will pay balance and shipping costs C.O.D.
Name . . . . . .
Address . . . . . .
City . . . . . Zone . . State . . . .

WATERLOO METAL BOXES AND CHESTS

BUY THE FINEST Metal Boxes
. . FOR EVERY SHOP USE

• Designed to meet exacting requirements of tool experts in every phase of automotive, radio, electrical, and industrial work. Unmatched for lightness, strength, beauty durability. See them at your hardware dealer now or write for free catalog.

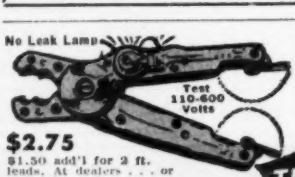
WATERLOO VALVE SPRING COMPRESSOR CO., WATERLOO, IOWA

VARIABLE SPEED HYDRAULIC POWER TRANSMISSION

It has Infinite Speeds 0 to 550 Reverse Automatic Overload Protection: Adjustable Torque up to 180 inch pounds, 5/8" Input and Output Shafts. It will handle 1/4 to 1 1/2 H.P. Motor. Case measures 7 1/2" long 7" high 6 1/2" wide. VALUE OVER $300. Shipping Wt. 25#. On C.O.D. Orders we require a 10% Deposit.

only **$54.50** Fob. Chicago

DIRZIUS MACHINE SHOP "U" 1423-25 52nd Ave., Cicero 50, Ill.



TEST Circuits, Fuses, Outlets *easily, quickly, safely.* Shockproof. Pull fuses 10 to 100 Amp.

$2.75
$1.50 add'l for 2 ft. leads. At dealers . . . or order direct from us.
Mailed POSTPAID

STAR* TEST-PLIERS

STAR FUSE CO., 237 Canal St., New York 13, N. Y.

x-acto
KNIVES • TOOLS
HANDICRAFT KITS

NO. 77 VIZI-DOME WOODCARVING SET $3.60

X-ACTO, INC.
48-41 Van Dam St.
Long Island City, N. Y.

Send 20¢ for 28-page Catalog

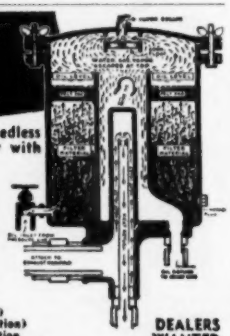
Print Your Own

Cards, Stationery, Advertising, labels, circulars, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too. **Print for Others, Good Profit.** Have a home print shop. Easy rules supplied. Pays for itself in a short time. Write for free catalog of outfits and all details.

KELSEY PRESSES, N-33, Meriden, Conn

STOP CHANGING MOTOR OIL!

End this needless expense forever with



RECLAIMO Today's Most Advanced OIL RE-REFINING filter FOR CARS, TRUCKS, TRACTORS

Continuously cleans and RE-FINES motor oil as you drive by utilizing motor heat — keeps oil in high grade lubricating condition at all times.

"RECLAIMO"
- REMOVES SOLIDS (by filtration)
- REMOVES WATER (by distillation)
- PREVENTS Excess Fuel Dilution
- PREVENTS Acid and Sludge Formation
- ADDS Thousands of Miles to Engine Life

MAINTAINS Stable Viscosity **ELIMINATES** All Oil Changes

Send for Free Vital 32-page book "OIL FACTS" (with bona-fide $1,000.00 offer on page 30). Gives you complete "Reclaimo" story and details of our extraordinary 90 DAY NO RISK TRIAL OFFER.

DEALERS WANTED

U.S. BUREAU OF STANDARDS, Bul. 56 States, "Oil does not wear out - mechanically."

RECLEAN FILTER CO.
5083 Elston Avenue Dept. P-12 Chicago 30, Illinois
Wm. Sawtier U.S. Pats. 17,7223, 1834654, 2068473.

BRONZE FOUNDRY

Schools and Home Workshops

Make your own castings of aluminum, copper, bronze, silver. Foundry sets are available in three sizes including 2400 Deg. F. blast Furnaces. $22.50; $29.50; and $42.00 f.o.b. Kansas City. Free Circular.

KANSAS CITY SPECIALTIES CO. P. O. Box 6022, Dept. S-12 KANSAS CITY, MO.

SMOOTH DOWEL RODS *introductory offer*

DOWELKIT Postpaid To Your Door. No Stamps or C. O. D.'s. **$1.98**

1/8" to 1" Diameter—All 12" long—100 Pieces of Assorted Diameters—All Hardwoods—Send Check or Money Order.

Other sizes and lengths available

DOWELCRAFT, 1202 Burton S. E. Dept. S Grand Rapids, Michigan

Take The "PAIN" Out of PAINTING

Basements . . . Fences . . . Furniture . . .

USE A BECKER CO2

SPRAY GUN

Take It Anywhere!
No Compressor . . .
No Electric Cords Needed.
Sprays: Paints, Oil, Varnishes Insecticides, etc.

Men! Women! Here's the easy way to lick those tough, tedious, tiresome paint jobs. Becker Spray Gun is fun to use, requires no electricity or compressors—pressurized by low-cost CO-2 cartridges each sprays up to 21 oz. containerful. Used 5 years successfully in industry.
SEE YOUR DEALER! If he cannot supply, order direct for pstpd. shpt. Extra cartridges 10 for $1.

SULLIVAN-BECKER CO.
Dept. 123-M Kenosha, Wis.

ONLY **$19.95** with box of 10 cartridges

SHEET METAL BRAKES

Angles, flanges, Pittsburgh locks. 24 G. steel, heavier aluminum. Cam locking, mount on bench, truck or floor stand. Truss braced-steel. Express collect. 30", 65 lbs., $28.50, 36", 75 lbs., $33.00, 48", 100 lbs., $48.00. Portable stands, 32" ht., 35 lbs., $7.00, 15", 40 lbs. capacity 16 gauge, $21.50.

IRON BENDER forms hooks, angles, eyelets, etc. Capacity ¼" x 2", 5/16" x 1½". All steel **$9.50**

30 CURVE FORMER. Forms straight and tapering pipes 2" to 2 ft. in diameter. 20 gauge, express collect. **$9.50**
(Immediate delivery. Order cash or C.O.D., or send for folder)

VYKE BRAKE CO., S-2439 15 St., Denver 11, Colo.

ONE-MAN SAWMILL LOW AS $50.00 DOWN

FREE BOOK

Take BELSAW Portable Sawmill right to the trees—turn out valuable lumber for home and farm — sell to local yards — make up to $50 a day custom sawing for neighbors. BELSAW lasts a lifetime. No crew needed. Power with tractor or auto engine. Beginners get excellent results. Send today for FREE BOOK, "HOW TO MAKE LUMBER".

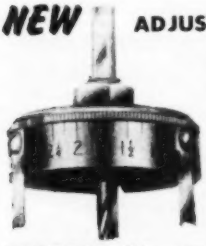
BELSAW MACHINERY CO
8465 Field Bldg. Kansas City 11, Missouri

BUILD OR BUY ARC WELDER

DUNBAR'S Build-Ur-Own PLANS show you how to build a 300 amp. DC Welder the easy way using an Aircraft Generator. Our Big FREE Catalog listing over 1500 items also lists 3-low-priced DC Welder KITS you can assemble in few minutes time. Send 25c today for your set of these Complete PLANS, catalog included. Or, send for the FREE Catalog.

DUNBAR MFG., 1031B-C2 Aurora Ave., Seattle 33, Washington

NEW ADJUSTABLE DIAL SAW and Rotary Planer



A twist of the Dial will instantly adjust blades to cut any size hole from 1⅛ to 2½ inches.

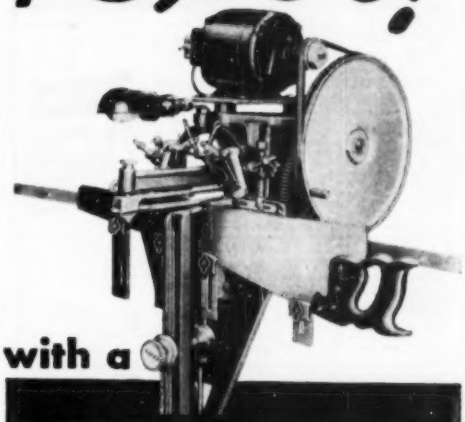
- Cuts Wood, Plastic, Steel, etc.
- ROTARY WOOD PLANER, simply remove pilot drill.
- Will fit ⅜" or ½" chuck.
- Inexpensive Replacement Blades

Complete; with 2 sets of steel blades and pilot drill. Postpaid, Only **$12.95**

See your dealer or order direct

ERWOOD, INC. 1774 W. Berteau Ave., Chicago 13, Ill.

Last Year's Profit $3,000!



with a FOLEY automatic SAW FILER

"Last year's profit amounted to $3,000. Not so bad for a one-man outfit"—from Chas. C. Hough. James B. Williams wrote us—"I made $765 last year filing saws, and it sure comes in handy. I do this work in my spare time." Men in communities of all sizes make up to $3 or $4 an hour with the Foley Saw Filer working full time or part time. That extra money comes in mighty handy in these days of high prices.

It's no trick to take care of the saw filing for your neighborhood hardware or lumber dealer plus looking after the saws for farmers, townspeople, manual training departments and factories. The Foley files all hand saws, also band and cross cut circular saws. It's a cash business, no canvassing, no eyestrain and no experience needed.

FREE BOOK SHOWS HOW TO START

"MONEY MAKING FACTS" shows just how you can start at home in your spare time working in your basement or garage. It's an immediate cash business that can develop into a full-time repair shop. Send coupon today—no salesmen will call.

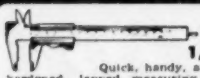
Send for FREE BOOK

FOLEY MFG. CO., 1219-3 Foley Bldg.
Minneapolis 18, Minn.
Send me free book **"MONEY MAKING FACTS"**

Name . . . . . .

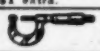
Address . . . . . .

WAR SURPLUS AND OTHER BARGAINS — SAVE UP TO 90%



NEW IMPROVED MODEL MAUSER-TYPE PRECISION 1/1000" VERNIER CALIPERS

Quick, handy, accurate. 6" Vernier Calipers. Glass hardened, lapped measuring surfaces. Fine engraved scales—1/1000" and 1/10 mm for inside, outside & depth measurements. Friction thumb release. Larger capacity. Two gib adjustments. Reg. $25. **Anniversary Special only $6.95.** Leather case $1 extra.



MICROMETERS Chrome plated, precision engineered, carefully tooled to give long life. All new 0-1" cap. $2.25 ea.; 1-2" cap. $3.50.

LOW VOLTAGE CIRCUIT TESTER

Made for U.S. Ordinance to rigid specification. Portable steel carrying unit, self-contained trouble shooting device makes complete & rapid check of generator battery circuit incl. any circuit & voltage regulators. Battery voltage, regulators, cut-out settings & generator performance easily determined. Any 6 or 12 volt system. Great for garages, mechanics, truck fleet owners, boat & marine mechanics. Every set checked out in our lab & in perfect condition. Shpg. Wt. 20 lbs. Approx. GOVT COST $175. NEW. Complete with instruction book.

Anniversary Special ....$29.75 ... WHILE THEY LAST!

D. C. GENERATORS—$14.95

The generators listed below will weld up to 3/8" plate steel or better. They all can be used as a combination welder and light plant.

Generators (Used) Pl. Perfect condition. 200 Amps. 28 Volts. 2500 to 4500 RPM. Wt. 53 lbs. Approx Govt Cost $350.-**$14.95.**

Electric Auto-Lite. 140 AMPS. 24 Volt. 2500 RPM. Makes a dandy arc welder. Wt. 53 lbs. Approx Govt Cost $450 **NEW $20.**

R1 Jack & Heintz. Rated 300 Amps. 30 Volts. Wt. 60 lbs. Approx Govt Cost $450. Guaranteed perfect. **$25.**

MAKE YOUR OWN ARC WELDER Complete make-up package consisting of one NEW Auto-Lite 140 AMP Generator (can be revved up to over 200 AMP), one giant toggle switch, one voltage regulator and a wiring diagram chart showing conversion of Aircraft Generator to Arc Welder. Special — **WHILE THEY LAST—$30.**

SENSITIVE ALTIMETER IN 10 FT. INCREMENTS 0 to 35,000 ft. (inches of Mercury). Tested and inspected in our own instrument lab. Guaranteed perfect. Ready to install. **$15.95 ppd.**

Send 25¢ for big 1953 catalog. Bargains for everyone. Check, Money Order or Cash. 25% deposit on C.O.D. orders. Prices F.O.B. Culver City, Calif., Unless otherwise stated.

AIRBORNE SALES CO. INC., Dept. PS1253 8501 Stellar Dr., Culver City, Cal

NEW! Every Electric Drill A Powerful PORTABLE JIG SAW

"ARCO JIG-SAW"

HAS SAME CAPACITY, CUTS AS FAST AS SAWS COSTING $50 & UP!

DOES THE WORK OF ALL THESE SAWS: JIG, KEYHOLE, COPING, RIP, CROSSCUT, BAND, HACKSAW.

HAS EXCLUSIVE BUILT-IN AUTOMATIC AIR BLOWER.

At Better Hardware Stores Everywhere

Pat. Pend.

ARCO JIG SAW

No. 500 "ARCO JIG-SAW" **$10.95** complete with blade

Here for the first time anywhere is a Portable Jig Saw that attaches in ONE MINUTE to any 1/4" electric drill. "ARCO JIG-SAW" will handle any project from the smallest to the largest. In minutes it cuts intricate patterns, circles, etc. in plywood, wallboard, plastics, metals—**even cuts lumber up to 2x4's!** It cuts openings for plumbing, switchboxes, etc. **without boring a starting hole.** Built-in **AUTOMATIC BLOWER** keeps cutting line free of sawdust.

"ARCO JIG-SAW" is a powerful, lightweight tool that is easy to handle because of its **Right Angle Drive.** Strong **Safety-Yoke & Worm Drive Clamp** make it a vibration-free unit. Extra large **Shoe-Plate** assures accurate and square cuts. Blades are changed in seconds with screwdriver. Converts to Table Model with

No. 401 "ARCO STAND" Sturdy Casting $2.75
No. 505 Six extra Blades for wood, metals, etc. $1.95

90-DAY FACTORY GUARANTEE

BUY THE BEST see your hardware dealer now! If not available, try "ARCO JIG-SAW" on our **10-DAY MONEY BACK GUARANTEE.** Send us check or M.O. (Postpaid), C.O.D.'s—postage extra.

DEALERS Write for nearest jobber.

ARROW METAL PRODUCTS CO.

Dept. PS-12, 140 WEST BROADWAY, NEW YORK 13, N. Y.

BARRON Drill Press TOOLS

ROTARY PLANER

Planes • Rabbets
Tenons • Panels
Routs • Bevels

Only $8.50 COMPLETE

FOR WORKSHOP AND INDUSTRIAL USES...

● Over 40 precision built woodworking tools and accessories . . . Hi-Speed Router Bits—Rotary Surface Sanders & Drum Sanders—Safety Shaper Cutters—Dovetail Cutters—Large Auxiliary Metal Tables—All Metal Shaper Fences — Spindle Adapters — Handy Bench Vises. Many other items indispensable for accurate, useful, versatile workshop use. Every tool sold on complete satisfaction or your money back. See your Barron Dealer. Ask for special folder — "24 Extra Uses for Your Drill Press."

FREE Workshop Guide & Catalog

BARRON TOOL CO. INC.
366 Architects Bldg., Detroit 1, Mich.

MAKE MORE MONEY!

Dealers or Representatives Needed for nationally advertised line of Spark Plugs — Oil Filters — Auto Specialties — Liberal Proposition — Full or Part Time — Experience Not Necessary — Write Today

ENGINE PRODUCTS MFG. CO.
8801 E. Beverly Blvd., Dept. 108, Los Angeles 22, Calif.

TERRIFIC TOOL SAVINGS

Send for 80 page Illustrated Catalog cram full of War Surplus Bargains in New Tools and accessories for home, workshop, hobbies and factory . . . exceptional values. Send 25c to cover handling charges to

COASTAL ABRASIVE & TOOL CO. 47 HOWARD ST. NEW YORK 11, N.Y.

Make Money Selling ESHELMAN Snow Plows & Plowing Snow From Roads & Driveways

CAR SNOW PLOW
CLEARS ROADS & DRIVEWAYS

$79.95 COMPLETE

Fits any car, jeep, truck. Attached in 2 minutes.
Clears snow 24" deep and full width of car. Lightweight, sturdy. Free literature. Write

Eshelman, Dept. SP-32
119 Light St., Balto. 2, Md.
333 N. Michigan Ave., Chicago 1, Ill.
7070 Hollywood Blvd., Los Angeles 28

Biggest PRECISION TOOL Values

IMPORTER'S WHOLESALE PRICES

HI-SPEED DRILLS
1/64-1/4. 30 for $2.95
1/4 -1/2. 10 for $3.00
1/4 Shank 5 for $2.50
5/16-1/2 Wood-7-$2.50

PRECISION CALIPERS
Helios w/case—6 inch $11.00
Precision 6 inch $6.95

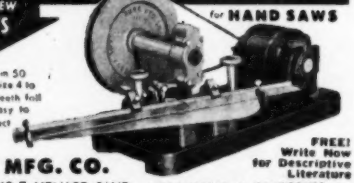
HELIOS MICROMETER
0-1 Lock Nut....$10.50
1-2 Lock Nut....$15.00

NEW DC GENERATORS
P.I. Incl. Diagram $21.00
R.I. Incl. Diagram $25.00

Check or M.O.
25% C.O.D. F.O.B. L.A.
METRO PRECISION TOOLS, 1507 S. Cienega, Los Angeles, Dept. 5

AUTOMATIC RETOOTHER for HAND SAWS

MAKES NEW PROFITS



Cuts new teeth in 50 seconds — any size 4 to 18 points. Old teeth fall off as chips. Easy to operate. A perfect job

FREE! Write Now for Descriptive Literature

BURR MFG. CO.
8943-T VENICE BLVD. LOS ANGELES 34, CALIFORNIA

GET "New Car" POWER!

- Stop Burning Oil!
- Restore Compression!

$3.95 postpaid

A small amount of Fisher's Compression SEAL in each cylinder bore gives you the economies of smooth, powerful "new car" performance and reduced oil consumption. Old, tired engines may not need expensive overhauling. Only takes minutes to apply—yet gives you 10,000 more miles of low-cost driving pleasure.

Satisfaction Guaranteed!
Full purchase price refunded immediately, if not completely satisfied. *No solvent baths necessary.* Order today! Sorry, no COD's. Free information. Dealer's inquire.

FISHER'S
4756 S. CENTRAL, DEPT. PS-12
LOS ANGELES 11, CALIF.

3 CU. FT. MIXER DIRECT FROM MFR. 39.75

Fills long felt need for small mixer for concrete, feed, fertilizer, seed and many other materials. Saves ½ cost of ready mixed concrete. Pays for itself on first job. Combination belt pulley and crank for hand operation. Also power mixers. Write for circular.

3 Cu. Ft. Drum—Mixes 2 Cu. Ft. Concrete $39.75
5 Cu. Ft. Drum—Mixes 3 Cu. Ft. Concrete 90.50

FOB Pulaski, N. Y. Cash, Check or M. O. Money back guarantee

UNITED STATES FORGE AND FOUNDRY CO
CONSTRUCTION EQUIPMENT DIV. PULASKI NEW YORK

NEW, IMPROVED CALCULATOR FOR WOODWORKERS only 25c

Instantly gives information on lumber, nails, concrete mixes, painting materials, etc. Convenient, simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of woods. 6" diameter heavily varnished cardboard. Send 25c, no stamps, please to Greenlee Tool Co., 2132 Columbia Avenue, Rockford, Illinois.

PLANS 35c **ARC·WELDER** BUILD YOUR OWN

USE AIRCRAFT GENERATOR 75-300 AMPS. D.C.

WE SHOW YOU HOW easy it is to build this Powerful Welder. Uses most any surplus aircraft generator. Requires no rewinding or special changes. Do your own welding—save many dollars. Complete simple plans 35c. Write for FREE War Surplus Catalog.

LEJAY MFG. CO.
1223 LeJay Bldg., Minneapolis, Minn.

FREE CATALOG
ALL KINDS OF WAR SURPLUS

PRACTICAL ENGINEERING CO.
7075 NORTH SHERIDAN TULSA, OKLA.

AT ALL HARDWARE STORES

FULLER'S *famous* "FOUR-IN-ONE" Screwdriver

All these blades included:
- No. 2 Recessed for cross head screws;
- ¼" Diameter for fine work;
- 3/16" for electrical work;
- ¾" Diameter for regular work;
- heavy aluminum chuck.

UNBREAKABLE HANDLE
HI-CARBON STEEL!

ONLY $1 set

FULLER TOOL CO., Inc. 3522 Webster Ave., N. Y. 67
Export Sales Dept. John H. Graham Co. 105 Duane St. New York U. S. A.

Gifts he will use

THE HEAD CAN'T FLY OFF. No more bother with loose or splintered handles. Estwing "Unbreakable" tools are forged in one-piece from tough tool steel. Grip is genuine leather, most comfortable and durable. Individually packed in colorful gift boxes. Axe $4.50, hammer $3.65. At all leading hardware stores. Write for FREE catalog.

ESTWING MFG. CO., Dept. M, Rockford, Illinois

SAVE MIDDLEMAN'S PROFITS ...buy DIRECT from C&H

LIGHT PLANTS

1000-1200 w AC, 115 v, 60 cyc. Powered by rugged 2½ hp easy-starting Continental gas engine. No wiring. Just plug in, ready to go. Complete with 12 v starting winding. Easily connected for push-button battery starting. Fully guaranteed, easily worth $325. Your Factory Price only $194. Other bargain price models in stock, 300, 1500, 2500, 5000 w, etc. SEND FOR FREE BOOKLET WITH VITAL FACTS ON HOW TO SELECT PROPER SIZE FOR YOUR JOB.

BOOSTER FANS

Fit any 8" to 12" furnace pipe. Mounting frame, 7" blade, 110v motor, 60 cyc, 1550 rpm with 6' cord. Silent operation. Easy to install. Warm those rooms with long runs. List $11.95. Our price . . . $6.95; two for $11.95; three for $14.95. Buy one for each room! REGISTER FAN for hot or cold air with bracket ready to mount; motor, 7" blade, 6' cord ONLY . . . $7.50; two for $12.95; three for $16.95.

Here are only a few big $ $ $ savings. More in our Catalog!

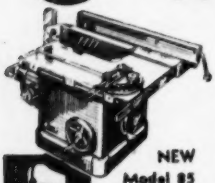
Air Compressor	Electric Motors	Hand Truck	Rubber Cable
Air Tank	Electric Switches	Hydraulic	Rubber Wheels
Block and Tackle	Elevator Drawing	Cylinder	Saw Tables
Blowers	Elevator Incline	Hydraulic	Shower Sprays
Bomb Trailer	Fans, Exhaust	Stacker	Starters
Buzz Saw	Fans, Heat	I Beam Trolley	Tools
Compressor	Booster	Lawn Mower	Transformers
Accessories	Fire Extinguisher	Sulky	Whiting Hoist
Clutches	Gas Engines	Magnetic Starter	Wilton Vise
Conveyors	Generators	Mail Chain Saw	Winch, Electric
Delta Tools	Grinders	Mail Grinder	Winch, Hand
Drop Cords	½ Ton Wagon	Pumps	4 Wheel Trailer
Electric Hoists	Male Fire Pump	Reduction Gear	

Get this catalog! 72 pages packed with useful charts, information, more than 1100 tool and equipment items at money-saving, factory-to-you prices. Send 25c (refund with first order) or write on company letterhead for free copy.

C&H ELECTRIC MACHINE Co. Inc.
438-A W. Juneau Ave., Milwaukee 3, Wisconsin

Darra-James POWER TOOLS

More For Your Money



NEW Model 85 Tilt Arbor SAW

Better in every way . . . larger work tables . . . sturdier frames . . . newest mechanical improvements. Darra-James engineering department is constantly working to give you more for your money.

Free Catalog

TOOLKRAFT CORPORATION
900 PLAINFIELD ST., SPRINGFIELD, MASS.

NEW TAPERED REAMER

HUNDREDS OF USES AT HOME, WORK!

OPEN UNDERSIZE HOLES quickly, easily. Here's the tool you always need and never have. A "must" for every craftsman. Why risk breaking expensive drills opening undersize holes? A few turns with this new tapered reamer opens a 1/8" hole up to 1/4" in metal, wood, plastic, etc. Useful in aligning two holes to be bolted or screwed together. Reams undersize holes from 1/8" to 1/4"

A TOOLBOX NECESSITY

Made of finest tool steel, correctly hardened and ground. Unbreakable plastic handle. Order yours today.

MASTER MFG. CO., Box 23, Buffalo 14, N. Y.

HANDY WORKBENCH

FOR CARPENTER, CABINET MAKER, ELECTRICIAN, RADIO SERVICE OR DARK ROOM PHOTO DEVEL.

Sturdily made with 2 x 4 legs, extra heavy plywood top, large center drawer and 5" backboard & tool rack. Shipped knock down. Overall dimensions 24" wide 48" long 36" high. Can be assembled in 30 minutes.

FREE DELIVERY Within 300 mi. when chk. or M. O. with order.

$14.85

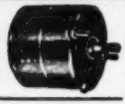
Plus 15c Pa. Sales Tax if in Pa.

WILLOW GROVE CABINET CO. 600 N. York Road, Dept. 2-B Willow Grove, Pa.

Send Check or Money Order, C.O.D. orders require $5 deposit.

SURPLUS BARGAINS! SATISFACTION GUARANTEED!

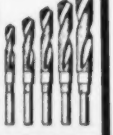
NEW CONTINUOUS DUTY 1/20 HP MOTOR



110-V. 60 Cy. 1750 RPM. Bronze bush bearings, 1/4" shaft. For fans, other long-running uses. Shipped postpaid. Only $4.85

HIGH SPEED 1/2" SHANK DRILL SETS

5 pc. Set No. 32 $14.50 • 10 pc. Set No. 33 $17.50 •

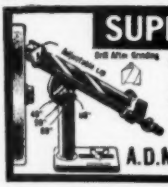


Both sets include sizes from 1/8" to 1 3/16". Highest tungsten content, sharp and ready to go. Reconditioned—all have at least 70% of original flute length. Fit any 1/2" drill, drill press or chuck. Shipped postpaid.

WRITE FOR OUR FREE CATALOG

T&T TOOL CO. Dept.-123 7667 GRAND RIVER DETROIT 4, MICH.

SUPER DRILL GRINDER



Sharpens round shank drills from 3/32" to 1/2" in diameter, up to 6" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee, only $2.95

At Dealers or Postpaid

A.D.McBURNEY 5908 Hollywood Blvd., Dept. S-36, Hollywood 28, Calif.

TRANSFORMER WELDER $18.95 FOB QUINCY

Complete with everything. Ready to plug in. 110 volts AC. 15-30 Amps. 3 heats. Welds metal from 1/16" to 1/4" using 1/16" to 3/32" standard rods. Guaranteed unconditionally. 10-day trial. No C.O.D. Does everything welders costing up to $75.00 do. Buy direct and save.

ESSAY MFG. CO., INC., Dept. 47, Quincy 69, Mass.

$40 A DAY BUSINESS IN YOUR SPARE TIME

ANDY PHILLIPS SAYS:

"My Belsaw Sharp Smith gives me big profits at low expense — I can run 35 to 40 Circular Saws in an 8-hour day — that makes me $40 cash."

"I also get BIG EXTRA PROFITS . . . up to $4 an hour . . . by grinding planer and jointer knives — there's always a demand for this kind of work."

You can start this REPEAT CASH business in your own home or garage while you are working at your regular job. Easy to operate, no experience needed. "My BELSAW paid for itself the first month." — H. J. Opie

For as little as $15 down payment, you can get your BELSAW SHARP SMITH rushed to you.

FREE book tells how ——→

LIFE-TIME SECURITY YOUR OWN BUSINESS

YOU can start making money the very day your BELSAW SHARP SMITH arrives. Hundreds of jobs in your own neighborhood. Send for Free book "Life-Time Security."

BELSAW MACHINERY CO
4408 Field Building Kansas City 11, Mo.

GOLD-SILVER-COINS

Easily located with new Lightweight M-Scope Detector. Superior performance, lowest price, monthly payment plan.

FREE LITERATURE

FISHER RESEARCH LAB., INC.
PALO ALTO CALIF.

WELD BRAZE SOLDER CUT

4 WAY WELDER

ONLY $14.75 f.o.b. factory

Complete with Twin Carbon Arc Torch and accessories . . . to handle all metal-craft work.

Acclaimed by thousands of Homeowners, Mechanics and Hobbyists as the welder of 1001 uses. Easily operated from properly wired 110 volt AC or DC line. The ideal gift with a life-long use. . . . Order today on 10 day money back guarantee.

FOUR-WAY WELDER CO., Dept. F3-N
2326 S. Michigan Ave. • Chicago 16, Ill.

SAVE UP TO 85% ON WAR SURPLUS

FROM WORLD FAMOUS 'GADGETEER'S' HEAVEN

FOAM RUBBER

SLAB — CORED

Relax in comfort after a rough day outdoors. Sleep on Foam Rubber. Ideal for sleeping bag pads, mattresses, chair or auto seat cushions.

SLAB STOCK

Thick	Per sq. ft	Thick	Per sq. ft
1/8"	$ .15	1/2"	$ .50
1/4"	.25	3/4"	.75
3/8"	.38	1"	1.00

CORED STOCK

1"	$1.00	3"	2.60
1-1/2"	1.50	4½"	3.00
2"	1.90		
2-1/2"	2.30		

FOAM RUBBER, BUNK BED MATTRESS – Top Quality. Soft and very restful. Size: 30" wide, 76" long and 4½" thick. TICKING–for above mattress $4.95 **34.95**

NAVY Sealed Beam LAMP

U.S.Navy Portable search-spot light. Has pistol grip & aiming sight. Makes an ideal Search, Spot or Emergency light for Auto, Boat or Camp.

12 Volt light – 4" lens $4.29
12 Volt light – 5" lens $4.29
24 Volt light – 5" lens $4.79
Set of 3 filters: red, green, amber for 5" size ONLY ..... **99¢**

GOOSENECK LAMP

A Real Surplus Buy!! For the Home or Workshop. An ideal lamp for student or craftsman. Has flexible shaft, socket, cord & switch. 110V. AC. **1.25**

GOOSENECK INSPECTION LAMP

Has black bakelite case with a 13 inch tubular metal extension. 7" of the extension is flexible allowing a 180° bend. Ideal for reaching into remote places with plenty of light for inspection, etc. Takes 2 ordinary flashlight batteries & comes with extra bulb. Has magnifying lens at tip. **1.95**

4-WAY SWIVEL LAMP

A handy lamp for desk, work bench, chart table, engine room, etc. May be used on 6 - 12 - 24 or 110 volt current by simply changing the bulb. Has 3 foot shaft with four movable joints to adjust light. **3.95**

SWISS PATTERNED NEEDLE FILES

For you riflemen who make or or repair your own guns – here is a set of files that will do that precise job. Made of the finest quality file steel, specially hardened and accurately machined for precision work.

NOW set of 12 assorted shapes **2.95**

1 inch GERMAN PRECISION MICROMETER

Reads from 0 to 1 inch in .001. Has ratchet stop and lock nut. Decimal chart on frame. One of the finest quality, imported, precision tools on the market. Case & wrench included at this low price.

$12.50 VALUE **NOW 9.75**

SAVE ON HYDRAULICS AT PALLEY'S

Here at Palley's we carry the WORLD'S LARGEST supply of special Hydraulic Equipment. Our huge stocks of Hydraulic Cylinders alone feature over 20,000 units in 61 sizes and types. We also stock thousands of accessories such as Hydraulic Pumps, Transmissions, Valves, Tanks, Fittings, Hose, etc.

HYDRAULIC CYLINDERS

No. 29 - Double Action Cylinder Gives 20,000 lbs. lift with a 1500 PSI line pressure, or will give 40,000 lbs. thrust on an intermittent 3000 lb. line pressure. Has a 4" bore, 1-1/2" diameter piston shaft. 18 inch stroke. 30-1/2" length. Ideal for presses, road, farm and shop equip. Cost Gov't $390. **29.95**

No. 3 – Double Action Cylinder – Bore is 1", Shaft 1/2", Stroke adjustable from 2-1/2" to 4" with internal sleeve stops. Length overall 8-1/2". Will take 1500 lbs. continuous – 3000 lbs. intermittent. Will lift or push up to 1100 pounds. **5.75**

No. 66 – Double Action Cylinder. Bore 2-1/4", Shaft 1", Stroke 4-1/2". Length 13-1/4". Lifts 6000 lbs. with 1500 lbs. pressure. **11.50**

No. 53 – Double Action Cylinder. Bore is 2-3/8", shaft 1¼", stroke 15½, length 26". Gives 6645 lbs. lift with 1500 lbs. line pressure. **20.50**

HYD. HAND PUMP

Has operating pressure of 2000 PSI. Capacity of 1.5 cu. inches per complete cycle. Our special price ONLY. **12.75**

HYDRAULIC ACCUMULATOR

A2C

Designed for pressures up to 2000 PSI. Has a 3" diameter by 18" long. **ONLY 10.75**

P-1A PESCO GEAR PUMP

Capacity, 1¼ GPM at 1500 RPM at 1500 PSI. Pressure limit is 1500 PSI continuous, with intermittent maximum of 1875 PSI for 15 seconds. Normal operating speed is 3750 RPM with an intermittent maximum speed of 4500 RPM. Rotates right-hand only. **Now 8.95**

NEW! PUMP FOOT MOUNT

Contains 2 first-line, high speed bearings. Mount plate has 4 holes – 2" from the center to center. Has spline shaft one side, key slotted 1/2" shaft on other side. **10.50**

Large Base FOOT MOUNT – For a pump up to 10 HP. Four mount holes are 3-1/2", center to center. Shaft is 3/4" dia., slotted. **14.95**

NEW VICKERS HYDRAULIC TRANSMISSION

Self-contained, constant torque at all speeds with variable volume, reversible piston pump which supplies piston hydraulic motor. Has 2 H.P. Automatic pressure dash pot for smooth control. Power output RPM –0 to 1/3 input RPM in both directions. Input RPM 1800 continuous, 4000 intermittent. Ideal for Lathes, Duplicator setup on Mills, Conveyors, Small Cars, Drives, etc. **42.50**

4" SPLINE SHAFTS for input and power take-off on above. Pair $2.50

INPUT & TAKE-OFF PLATE ASSEM. To adapt above to pulley drive. Has 1/2" keyway shaft. 2 first-line, shielded high speed bearings in each unit. Per Set .. $20.00

PROP PITCH MOTOR

Another AMAZING War Surplus Bargain! Electrically operated on 20 to 32 volt AC or DC current. Will develope 1/2 HP with a high torque output. Drive gears are 7000 to 1 ratio. Ideal for use in rotating TV or directional beam antenna. Final take-off gear turns approximately 1-1/4 RPM. **10.95**

SURPLUS ELECTRONICS & RADIO MIX

A Jumbo Surprise Package containing controls, coils, switches, wire and a variety of other valuable radio and electronic devices.

A BARGAIN BUY! **2.25**

NEW – TURNING GOUGE

A heavy duty, wood turning tool. Made of tempered steel to hold a sharp cutting edge. Especially suited to furniture work and for making first cuts in hard wood. Overall length with handle, 19". Blade length 8½", width 2 inches. Comes with handle. **4.95**

CHEMISTRY SET

Made for Chemical Warfare Division for testing water, etc. A handy addition to the chemistry lab or an exciting experiment for the amateur. Set includes test tubes & complete instructions. 15 different items. Packed in attractive Lucite box with cover and dividers. . . . **1.89**

ARMY PORTABLE SHOVEL

Carry in the car for an emergency snow shovel. Has 20" wood handle. Blade folds to make a shovel or pick axe. An ideal unit for motorist, camper, gardener, farmer, etc. **1.49**

USAF THROAT MICROPHONE

Genuine USAF type T-30-0 Gives distinct voice reproduction for aircraft or amateur radio broadcasting. Consists of two microphones, mounted on rubber neckpiece elastic neck band. Operates between 100 & 300 ohms . . **1.39**

SIGNAL CORPS TEL. KEY

The new model J5A with ball type, flame-proof, metal key, perfectly balanced to permit positive contact with minimum effort. An ideal instrument for "ham" or professional use. A BUY at . . NEW **1.89**

RADIO ANTENNA REEL

For tuning beam antenna. Powered by 1/8 HP, 24V, DC motor, engaged to gear reduction only when electrical contact is made. Operated in either direction. Ideal for auxiliary power take-off. 150 RPM at take-off. Used for opening & closing doors etc. A tremendous value. NEW **8.75**

UNIVERSAL JOINT

Rotates with full flexibility from 90 to 180 degree angle. Body is solid bronze. Drive shaft is 1" dia. steel. Joint is Ball and Socket type. Ideal for use on boats and heavy machinery. **5.95**

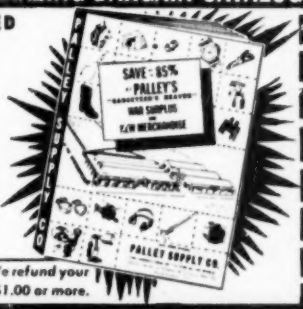
RIGHT ANGLE DRIVE

Has direct 1 to 1 ratio through 90° bevel gears. Drive & take-off shafts are 3/8" diameter. Gears are self-lubricating hi-speed steel. Ideal for use on power tools, flex drives, etc. Size 3½" x 2¼" x 1¼". Many other types Gear Boxes and Flexible Drive Shafts in stock. See Catalog! **2.25**

1954 Edition of WORLD'S MOST AMAZING BARGAIN CATALOG!

320 PAGES — FULLY ILLUSTRATED

Larger than ever before. Packed with SENSATIONAL VALUES in ***WAR SURPLUS, FACTORY CLOSE-OUTS*** and ***GENERAL MERCHANDISE!*** Included are thousands of items in Hand & Power Tools; Hydraulic Cylinders, Pumps, Motors, etc.; Hardware; Industrial Tools; Cameras and Photo Supplies; Outdoor and Sporting Equipment; Microscopes, Binoculars, Telescopes, etc. Foam Rubber, Aircraft Parts, Electrical Motors, Blowers, etc. Gadgets plus many, many more hard-to-find items.



Only 50¢ **Order Your Copy Today! We refund your 50c on your first order of $1.00 or more.**

PALLEY SUPPLY CO. 2263 E. VERNON AVE. DEPT. PS-12 LOS ANGELES 58, CALIF.

Order From This Ad. Pay by M.O. or check. P.O.'s accptd. from D&B firms. 1/3 deposit with C.O.D.'s. All Prices FOB Los Angeles

Rocket Water Yields Wonder Products

[Continued from page 149]

proving effective against germs able to withstand either medicine alone.

Some derivatives of hydrazine apparently reduce high blood pressure and clear up urinary-tract infections. Others are being used in the preparation of certain kinds of vitamins, sulfa drugs and hormones.

Helps Coat Metals

This versatile stuff reacts so readily with oxygen that it is highly useful as a reducing or deoxidizing agent. Copper, nickel, silver, gold, platinum and other metals can all be separated in pure form from various compounds through the use of hydrazine. With hydrazine's help, thin coatings of metal can be applied to glass and plastics. Used as a soldering flux for copper and brass, hydrazine hydrobromide leaves no corrosive residue. A little hydrazine added to the water of steam boilers takes out dissolved oxygen and thus fights corrosion.

Chemists have hardly more than begun to develop the commercial possibilities of this versatile building block. They know that it can lead to new dyes, disinfectants, detergents; to wrinkle-resistant coatings for textiles; to stronger, more elastic, yet finer synthetic fibers; to new and improved plastics.

Supply Up, Price Down

How fast such possibilities will be realized depends on the supply of hydrazine, which is going up—and the price, which is coming down. When hydrazine was being manufactured for experimental use only, it was priced at $50 a pound. Today it stands at somewhat less than $2.50, and Matholin officials believe that further improvements in the manufacturing process may eventually drop the figure to 50 cents. To see what this means to chemists, consider the following:

Hydrazine, like ammonia, belongs to a family of more than a dozen nitrogen-hydrogen compounds called hydronitrogens. In structure they resemble the familiar carbon-hydrogen compounds known as hydrocarbons.

Hitherto the industrial chemists have worked most of their miracles with the hydrocarbons, whose carbon atoms can be joined fairly easily into rings and chains, forming building blocks that in turn have yielded wonders like nylon and synthetic rubber.

To a limited extent they have been able to join the nitrogen atoms of the hydronitrogens, too. And this is important, because different qualities are imparted to drugs, dyes and other materials when they contain nitrogen instead of carbon. But building blocks of this kind have not been produced in large quantities, because it has been difficult to hook up the nitrogen atoms of available hydronitrogen compounds.

Hydrazine Makes the Difference

Hydrazine changes the picture. Its favorable structure, with two highly reactive hydrogen atoms swinging from each of two tightly linked nitrogens, makes it an ideal building material of the hydronitrogen family. Already these possibilities are being explored. Further reduction in cost could make hydrazine a serious competitor of the hydrocarbons, as a raw material, in much wider fields. And so big news is in the making, in industrial laboratories, now that the search for a rocket fuel is transforming hydrazine from a scarce and costly material into a readily available and popular-priced commodity. END

Simple Explanation

THE chemistry professor was giving a demonstration of the properties of various acids. "Now, I am going to drop this silver dollar into this glass of acid. Will it dissolve?"

"No," was the prompt reply from a student in the rear.

"No?" queried the professor. "Then perhaps the young man will explain why the silver dollar won't dissolve."

"Because," said the student, "if it would, the professor would not drop it in."—*The Columbian Crew.*

MASTER GARDENER

SELF-PROPELLED
It's a snow-blower
It's a power sickle
It's a cultivator

NO PUSHING

Tractor shown with Snow Blow Attachment

It's a rotary tiller

It's a plow

It's a rotary mower

(Item 206)

Where can you get a power tool that does so many jobs? Works for you the year 'round. Does terrific job of cleaning snow from walks, drives, etc. without backbreaking work. Also prepares deep mellow seed beds, cuts weeds, lawns, etc. The Master Gardener performs better—does more than tractors costing twice as much. Converts in minutes to Tiller, Power Sickle, etc. Basic, self-propelled 2 hp. tractor. Briggs or Clinton engine.. **$119.50**

Snow Blow.......... **$39.50**
Cultivator **$8.75**
Rotary Tiller.......... **$42.50**
Disc Harrow.......... **$15.75**
Furrowing Tool.......... **$8.75**
Plow **$15.00**
Rotary Lawn Mower.... **$42.50**
Sickle Bar Mower..... **$42.50**
Lawn Mower Hitch..... **$4.50**

Freight prepaid to most areas. Easy payment plan available.

HEAVY DUTY D-C ARC WELDER

with mounting flange (Item 38)

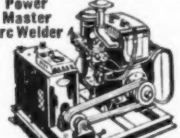
Use as portable or shop welder. Up to 300 amps. Senior model. Made for years of trouble-free, continuous service. Will handle light or heavy jobs. Easily welds up to 3/4" plate using 1/4" rods. Built-in air cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hi-lo switch and dial control gives wide range of welding heats. Run welder at 2600 rpm. with tractor, jeep or 14 hp gas engine or 7 hp elec. motor. Complete with instructions, guar. and **triple** V belt or flat pulley. You can pay more, but you can't buy a better welder. (Item 38) Wt. 110 lbs. $400 value at.. **$99.75**

DUAL CONTROL MODEL same as above but with built-in dual rheostat for low heat soldering, brazing, welding. Special...... **$119.50**

WELDING KIT. Two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at........ **$10.50**

Write for prices on A.C. Arc Welders.

Power Master Arc Welder

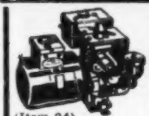


(Item 280)

Now! a portable, rugged, self-powered industrial type welder with terrific performance, yet at a price hundreds of dollars less than you'd expect. High capacity DC welding unit enables you to tackle any job with confidence—easily handles anything up to 2" plate using from 1/16" to 1/4" rods. Built-in stabilizer and dual control simplifies any welding job from 30 to 250 amps. Welder is powered by 14 HP 2 cylinder air cooled Wisconsin industrial engine with triple V-belt drive. Mounted on a welded steel chassis—easily transported on trailer or pick-up truck. Ideal for shop, factory or farm welding. Complete with instructions and guarantee. Wt. 480 lbs. Compares with welder costing $1200. (Item 280) Factory Special........... **$499.50**

YOUR OWN EMERGENCY POWER AT DIRECT FACTORY PRICES

PORTABLE LIGHT PLANTS



(Item 24)

PUSH BUTTON START A.C. LIGHT PLANT 600-700 watts—115 v.—60 cyc. A.C. Powered by a rugged 2 hp. easy-starting Briggs gas engine. No wiring necessary, just plug in and operate. Plenty of current for any oil burner, freezer, brooder, emergency lights, etc. which require up to 700 watts. Ideal for Civil Defense, Fire Depts., trailers and camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. Item 24. Wt. 75 lbs. *Be prepared if war or storm knocks out power lines.* Reg. $275 value.. **$143.50**

700-800 Watt Plant (Item 44) same as Item 24 but larger engine.... **$169.95**

1000-2000 Watt Plant (Item 45) same as Item 24 but larger generator & engine.... **$199.50**

1500-1700 Watt Plant (Item 20) — Similar to Item 24, but has three times more capacity. **Wt.** 173 lbs. Factory price.......... **$279.50**

350 Watt Plant (Item 273) 115 v. D.C. 1 1/2 hp. Briggs Engine. Perfect for lights, radios, small power tools Wt. 65 lbs. Factory price........... **$99.75**

GIANT 2000-2500 WATT PLANT

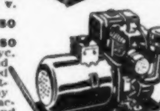
(Item 31)

110-120 V. 60 cyc. A.C. **Absolutely the best made**—exclusive dynamically balanced armature; heavy windings develop up to 5000 watt overload for motor starting. Skid-mounted—portable. Powered by easy starting Briggs or 6 hp. Wisconsin engine—complete with all accessories; engine easily disconnected for other uses. Big outlet box, voltmeter, no wiring necessary. Ample current for all purposes. Factory warranty and complete instructions included. (Item 31) Wt. 210 lbs. Reg. price $585.00. Special at **$299.50**

Generator Only and control box........ **$169.50**

3000-3500 WATT PLANT (Item 198) **110-220 v.** 60 cyc. A.C. Belt drive Wis. Engine. **Push button start.** Wt. 370 lbs. **Heavy duty $399.50**

Generator only for belt drive, Wt. 115 lbs. (Item 198A).................. **$239.50**



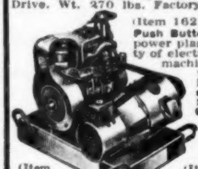
(Item 21)

MASTER-LITE 2500 Watt Plant 110/120 v. 60 cyc. AC. A powerful plant, ruggedly constructed and yet designed for easy portability. Can be started by rope or built-in 12 v. electric push button starter. Built-in winding to charge battery. Powered by a big 5.10 HP Briggs engine, complete with all accessories. Includes control box, voltmeter, and handy plug-in power receptacle. An ideal plant for permanent or stand-by service. Wt. 225 lb. Reg. price $645.00. Factory Price (Item 21) **$329.50**

3500 Watt Plant (Item 23) 115 v. 60 cyc. A.C. **Push Button Start.** Direct Drive. Wt. 270 lbs. Factory Price.................. **$379.50**

HI-LINE 6000 WATT PLANT

(Item 162)



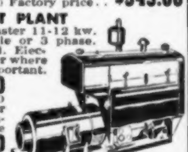
(Item 162)

Push Button Start, 115-230 v. 60 cycle A.C. A brute of a power plant with a rugged 14 hp. Wisconsin engine. Plenty of electricity for ranges, water heaters, freezers, pumps, machinery, etc. Affords both 110 and 220 volts. Ideal where heavy current is needed. Wt. 590 lbs. Easily worth $995.00. **With self starter.** Factory price............ **$645.00**

Same plant but with **Crank Start.** (Item 166)........... **$585.00**

Generator and control box only, belt driven. Use your own engine or tractor. Wt. 240 lbs. (Item 163) Factory price.. **$345.00**

DIESEL LIGHT PLANT



(Item 1660)

(Item 1660) Diesel Master 11-12 kw. 115/230 v. AC. Single or 3 phase. 1800 rpm. direct connected. Electric Self-starting. Engineered for permanent power where continuous low cost, heavy duty service is important. Wt. 1350 lbs. Reg. list $3650.00. Factory price........... **$1895.00**

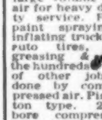
10-11 kw. **GAS DRIVEN PLANT.** 115-230 v. 60 cyc. AC. Single or 3 phase, powered by 4 cylinder Wisconsin air cooled engine. Belt driven. Constructed similarly to Hi-Line 6 KW shown above but much larger. (Item 217) (with crank start) Wt. 900 lb. Factory price **$1075.00**

Same plant with elec. self-starter.... **$1145.00**

We make fully automatic controls to operate any of the above light plants. Write for details.

WE MAKE ALL SIZES UP TO 25,000 WATTS

HEATING & VENTILATING FAN



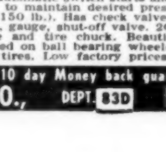
(Item 10) Easily installed in furnace pipes. Forces even heat to all rooms. Over range removes kitchen smoke and odors. Powerful, continuous duty motor, 110-120v. AC. Mount in wall or ceiling to ventilate any area.

Quiet, super efficient fan moves huge volume of air. (400 to 600 CFM).

8" Fan, wt. 5 lb............ **$6.85**
9" Fan, wt. 6 lb............ **$7.85**
10" Fan, wt. 7 lb............ **$8.85**
12" Fan, wt. 8 lb............ **$9.85**

HEAVY DUTY FAN, Semi-enclosed motor, suitable for spray booths, restaurant exhausts, poultry houses, etc.
10" Fan, wt. 8 lbs. (Item 10E) **$11.95**
12" Fan, wt. 10 lbs. (Item 10D) **$12.95**

MASTER AIR COMPRESSOR



Tank Tested up to 500 lbs. per sq. in.

(Item 209) High pressure type for large volume of air for heavy duty service. For paint spraying, inflating truck & auto tires, greasing & the hundreds of other jobs done by compressed air. Piston type. 2" bore compressor with built-in air filter. Master built with high strength alloys and precision bearings. **Stainless steel tank,** 12"x24", 2100 cu. in. cap. Heavy duty automatic switch starts and stops motor to maintain desired pressure (up to 150 lb.). Has check valve, safety valve, gauge, shut-off valve. 20 ft. air hose and tire chuck. Beautifully balanced on ball bearing wheels and rubber tires. Low factory prices.

With 1/3 hp. motor, 110v. AC motor. Reg. $175. (Item 209p).......... **$109.50**

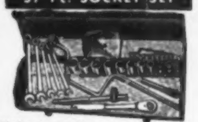
With 1/2 hp. motor. Reg. $199.50 (Item 209Ap) **$129.50**

2 hp. Briggs Gas Engine. Reg. $199.50. (Item 209Bp) **$119.50**

6 FT. FLEXIBLE SHAFT

A precision built, heavy duty tool with amazing flexibility. Replaces a dozen individual tools—drills, buffs, grinds, sands, saws—handles jobs in impossible places. Fits any 5/8" motor shaft or use with drill press, grinder lathe, gas engine, etc. Heavy duty 5/8" piano wire core encased in tough rubber housing. Handle and arbor have rugged industrial type precision ball bearings for years of service. Arbor takes all 1/2"-20 standard threads. Use with any 1/4, 1/3 or 1/2 hp motor. Wt. 10 lbs. Reg. $29.95.. **$15.95**

37 Pc. SOCKET SET



Highest quality, guaranteed non-breakable sockets made by Husky. Beautifully matched chrome alloy. Absolutely the best. Complete range of 17 sockets from 1/4" thru 1/2" (1/4" drive) and 7/16" thru 1-1/16" (1/2" drive), 1 extension, reversible 1/2" ratchet, adapter bit, sliding "T" handle, "L" handle, 1/2" speeder, 5 pc. alloy combination wrench set, 8 pc. Allen wrench set, and a big doghouse tool box. We challenge anyone to match this value. Easily worth $41.95. Wt. 14 lb. (Item 59)...... **$16.95**

44 Pc. SOCKET SET

(Item 596) Same unconditionally guaranteed, non-breakable sockets as above—but with added sizes. Complete range of 21 sockets from 1/4" thru 7/16" (1/4" drive) & 7/16" thru 1-1/16" (1/2" drive). Two extensions, reversible 1/2" ratchet, 3 drift punches, sliding "T" head, all angle coupling, 1/2" speeder, 1/4" breakover, 5 pc. high chrome alloy combination wrench set and 8 pc. offset wrench set in **big** doghouse tool with ample room for other tools. Reg. $49.50 Wt. 16 lb......... **$21.95**

52 Pc. SOCKET SET

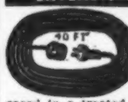
(Item 205) Contains a complete set of sockets in 1/2" drive, 3/8" drive and 1/4" drive, plus all necessary extensions, handles, speeders, reversible ratchets, etc.: all uncond. guaranteed against breakage. Beautiful matched chromed thin wall alloy sockets in a sturdy handsome steel box. Wt. 17 lbs. List price $62.90 Factory Special..... **$27.95**

JET FLOW BLOWER

Tremendous air movement (1700 CFM) and quiet operation make this double inlet 10" turbine blower unbeatable for heating, cooling, drying and air conditioning. Ideal for attic or barn ventilation, converting gravity heating to forced air; spray booth exhausts, etc. Operates with any 1/4, 1/3 or 1/2 HP motor. Oversized, long life bearings. Includes variable speed motor pulley and belt. Dimensions 19" hi. x 8 x 16 1/2". Outlet opening 13"x11 3/8". Wt. 45 lbs. (Item 245). Reg. $54.50. Special. **$27.50**

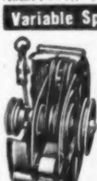
HEAVY DUTY 1/4 HP motor for above.............. **$16.95**

EXTENSION CORD



(Item 16) Heavy duty, made of Buna rubber insulated #14-2 conductor, stranded wire encased in a treated braid jacket. **So tough that you can drive over it.** Use indoors or out. Resists oil, grease or water. Extends electricity up to 400 ft. without voltage drop. Complete with heavy rubber plug and outlet. Comb. 2—40 ft. & 1—20 ft. (total 100 ft.) (Item 16c) **$4.95**

Variable Speed Selector

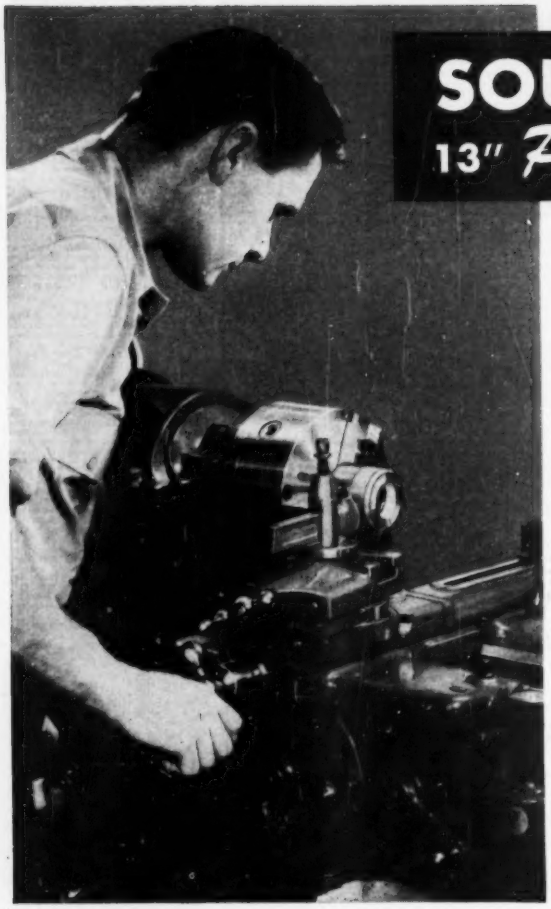


(Item 68)

Heavy duty, made by **B. F. GOODRICH** for industrial use. Provides instant speed changes for any drive. For machine tools, dryers, printing, conveyors, production lines, hoists — any operation requiring variable speed. Ideal for midget autos. Employs reliable "trouble free" planetary system. No hydraulic power losses or creeping. Infinite range, smooth operation, easy installation (data included). 3 sizes: 1/2-1 hp. wt. 36 lbs.; 1-2 hp. wt. 55 lbs.; 2-3 hp. wt. 105 lbs. Reg. list $228, $252 and $352. Our prices . . . **$79.50, $89.50 and $114.50.**

Send check or M.O. Prices f.o.b. Factory. 10 day Money back guarantee. SEND 10c for . . . *BIG 1954 Catalog*

MASTER MECHANIC MFG. CO., DEPT. 83D **Burlington, Wis.**



SOUTH BEND
13" *Precision* Lathes

for accurate, low-cost machining

These lathes are popular in the toolroom, production shop, or wherever varieties of precision parts are machined. Users prefer them for their simplicity and practically effortless handling. Job set-ups and tooling changes are made so quickly and easily that down-time is held to a minimum. A very complete line of attachments simplifies tooling. Send coupon for complete information.

SPECIFICATIONS

Swing — 13⅛" over bed and saddle wings, 8" over cross slide.

Distances Between Centers — 28¼", 40¼", 52¼" maximum.

Collet Capacity — 1" maximum (Collets interchangeable with South Bend 10"-1" Collet, 14½", 16" and 16-24" lathes).

Spindle Bore — 1⅜".

Spindle Speeds — Eight, 40 to 940 r.p.m., approximate.

Power Longitudinal Feeds — 48 R.H. or L.H., .0015" to .0841".

Power Cross Feeds — 48, .0006" to .0315".

Thread Cutting — 48 R.H. or L.H. pitches, 4 to 224 per inch.

Send For This Book!

Every machinist needs "How to Run a Lathe." This helpful handbook contains 128 pages and over 365 illustrations and diagrams on all phases of lathe operation and care. Price postpaid 50 cents.

Can I get it? When? How?

Yes—you can get most any South Bend product immediately from our distributor's stocks in principal cities. Items not stocked, shipped promptly from factory.

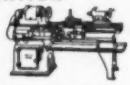
Three ways to order:

1. See or telephone nearest distributor.
2. Order by mail from your distributor.
3. If no distributor is nearby, order direct from factory.

South Bend machine tools with accessories may be purchased on convenient terms up to 12 months.

SEND INFORMATION CHECKED:

☐ 9" and 10" BENCH LATHES

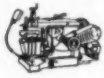


☐ 10" to 16-24" FLOOR LATHES

☐ DRILL PRESSES

☐ TOOL GRINDERS

☐ ½" & 1" Collet TURRET LATHES



☐ 7" BENCH SHAPERS

Name_____ Company_____

Street_____ City & State_____

Building Better Tools Since 1906 • **SOUTH BEND LATHE** • South Bend 22, Indiana

TIRED OF A HUMDRUM JOB AND LACK OF MONEY?

LEARN HOW YOU CAN BUILD YOUR OWN BUSINESS, HAVE A GOOD INCOME SPARE TIME OR FULL TIME IN YOUR OWN HOME

CUT OUT AND MAIL THIS CARD NOW

FIRST CLASS
PERMIT NO. 20091
(Sec. 510, P. L. & R.)
LOS ANGELES, CALIF.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c POSTAGE WILL BE PAID BY

COAST INDUSTRIES
1004 So. Los Angeles Street
Los Angeles 15, Calif.
Dept. 1C

MEN-WOMEN!

SIL

BUILD A BIG PROFIT HOME BUSINESS...

FLOK KRAFT

with NEW

Suede Paint

the NEW WONDER FINISH that COVERS EVERYTHING

...Plastic, Fabric, Metal, Plaster, Wood, Rubber... any Surface!

MAKE $500 to
PER HOUR and

SECRETS OF NEW INDUSTRY NOW YOURS

At last, secrets of this amazing miracle finish can be yours! Huge profits waiting to be tapped in tremendous new field. Flok-Kraft gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines, auto dash boards — a thousand and one items to be seen on every hand easily and quickly beautified, enriched in value with Flok-Kraft. Make old objects beautiful — saleable, make new things worth much more with this soft, rich covering. Can be applied to any surface, even if old or worn.

DASHBOARDS

Big Profits Right Away—Lea

Make $5.00 — yes! even $10.
hour. Fully detailed Flok-Kra
complete and easy to underst
explained—shows you how to
to big money, full or spare ti

We Furnish Everything You

You also get complete Flok-K
rials and equipment that ena
at once. Add to your income f
job or begin to build a succe
your own and do it all, right i
basement, garage, service p
living-room.

Grasp This Lifetime Oppo

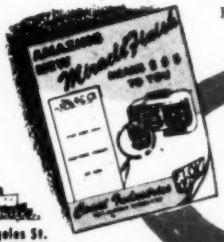
I'll arrange to send you th
Kraft outfit — everything ne
leisurely no risk examination
home. You owe it to yourself
wonderful opportunity now!
the postal card at right for F
ple, plan etc. Do it today. F
you now is free of charge a
no money—just r

Yours to Examine Without Risk

Examine in your own home—then decide. The complete instructions, the full starting kit of materials and equipment plus full details on how you may open your own business—spare or full time—EVERYTHING will be sent to EXAMINE AT OUR RISK.

FLOK-KRAFT IN INDUSTRY

This amazing miracle finish is of inestimable value for use on hundreds of manufactured products. Flok-Kraft offers you a way to big, extra money, assisting manufacturers in many lines as well as filling a big demand among home owners.



MAI
POSTAGE-
NOW FOR
SAMPLE PI

Coast Industries Dept. 1C 1006 S. Los Angeles St. Los Angeles, California

—Learn in Few Hours

$10.00 and more per
k-Kraft instructions—
derstand—every point
w to start on the road
re time.

You Need To Start

lok-Kraft kit of mate-
t enables you to start
ome from your regular
successful business of
ght in a corner of your
ice porch, kitchen or

Opportunity TODAY!

u the complete Flok-
ng needed to start, for
ation right in your own
rself to investigate this
now! Fill out and mail
for FREE details, sam-
ay. Everything I send
rge and postpaid. Send
just name and address.

MAIL
GE-FREE CARD
OR BOOKLET,
E PLAN!

HERE'S PROOF! I have helped many hundreds of men and women on their way to success in FLOK-KRAFT. I will be glad to help you! *Nels Irwin*

"... this Flock-Kraft sure sells itself. Thanks to you and your organization, I'm on my way of starting a business that I hope will bring security to me and my family in the future years."
Yours truly
R. L.—Ohio

Gentlemen:
Received the flok-kraft outfit and everyone that saw it is very enthused.
I only had it about thirty minutes and got an order for a hundred dollar job and promises of several more.
Yours truly,
Mr. C. H., Maryland

"... It might interest you to know that Flok-Kraft recently won first prize in a local Christmas season contest put on by the local newspaper."
R. H., Missouri

Got $52.50 for those 7 trunk interiors for about 4 hours work. $7.50 per trunk.
Very truly yours
J. O., Missouri

"First let me say that I think you would be gratified and delighted to see how enthusiastically flock is received by those I have shown it to in this area. ... I don't have to sell Flok-Kraft—it sells itself."
F. L. M., Texas

"... To start a business of my own has always been one of my foremost ambitions. I've at last done just that with very little equipment and no previous experience whatever, thanks to Flok-Kraft ..."
N. J. M., California

The investment I made in the Flok-Kraft course seems to be the best investment I ever made in my life.
I know I can do a lot of business with Flok-Kraft."
Yours truly, F. H.

"Dear Sir,
... I would like to thank you for helping me open a field in which so far I've been very successful."
Yours sincerely, D. H.

The original of these and many more enthusiastic letters about FLOK-KRAFT are in our files and open for your inspection.

CUT OUT AND MAIL CARD

Investigate!

FLOK KRAFT TRADE MARK REG.

IT DOES NOT COST YOU ONE CENT!

COMPLETE DETAILS SENT FREE

I want to arrange to send you complete Flok-Kraft outfit for a leisurely examination in your own home. You owe it to yourself to investigate now. Fill out this postage free card. Clip on dotted line and mail now. No postage is required if mailed in the U.S.A.

COAST INDUSTRIES—DEPT. 1C
1004 South Los Angeles Street, L. A., 15, Calif.
Mr. Nels Irwin:
Please rush me free details, sample, etc. I understand that everything you send is free and that I'll be under no obligation of any kind whatsoever.

Name _____

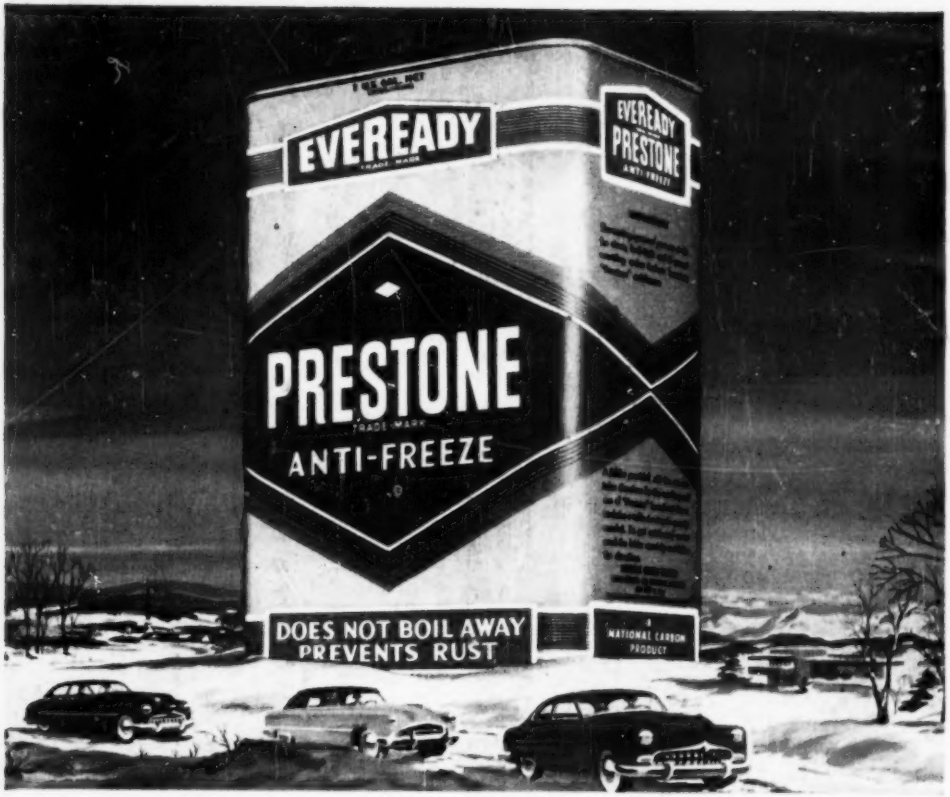
Street _____

City _____ Zone ____ State _____

POSTAGE PAID BY COAST INDUSTRIES

SEE OTHER SIDE

NO OTHER ANTI-FREEZE GIVES YOUR CAR THE SAME COMPLETE PROTECTION!



You're SET...

One shot lasts all winter. Just put "Prestone" anti-freeze in and forget it till spring! No boil-away . . . no repair bills – its special inhibitors give the best protection against rust, clogging and foaming.

You're SAFE...

High compression engines and efficient car-heaters make non-evaporating anti-freeze more important now than ever. There's not one drop of boil-away alcohol or methanol in "Prestone" anti-freeze.

You're SURE...

With "Prestone" brand anti-freeze in your car, you're sure you've bought the best. It's America's No. 1 brand. No other anti-freeze gives your car the same complete protection. It's guaranteed!

$3.75 per gallon • $1.00 per quart, in quart cans

PRESTONE ANTI-FREEZE

BRAND

NATIONAL CARBON COMPANY • A Division of Union Carbide and Carbon Corporation

30 East 42nd Street, New York 17, N. Y.

The terms "Prestone", "Prime" and "Eveready" are trade-marks of Union Carbide and Carbon Corporation

NEW!

"PRIME"

GAS LINE ANTI-FREEZE

Ask your "Prestone" anti-freeze dealer about it . . . 65¢ per can.